D-Link®

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User Manual

Mobile Wireless 3G Router

DIR-412

Preface

D-Link reserves the right to revise this publication and to make changes in the content hereof without obligation to notify any person or organization of such revisions or changes.

Manual Revisions

Revision	Date	Description
1.0	May 19, 2010	• First Release

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Package Contents

D-Link DIR-412 Mobile Wireless 3G Router	
Power Adapter	
Ethernet Cable	
CD-ROM	

Note: Using a power supply with a different voltage rating than the one included with the DIR-412 will cause damage and void the warranty for this product.

System Requirements

Network Requirements	• An Ethernet-based Cable or DSL modem / 3G USB Adapter • IEEE 802.11n/g wireless clients • 10/100 Ethernet
Web-based Configuration Utility Requirements	**Computer with the following:** • Windows®, Macintosh, or Linux-based operating system • An installed Ethernet adapter **Browser Requirements:** • Internet Explorer 6.0 or higher • Chrome 2.0 or higher • Firefox 3.0 or higher • Safari 3.0 or higher **Windows® Users:** Make sure you have the latest version of Java installed. Visit www.java.com to download the latest version.
CD Installation Wizard Requirements	**Computer with the following:** • Windows® 7, Vista®, and XP (Service Pack 3) • An installed Ethernet adapter • CD-ROM drive

Features

- **Faster Wireless Networking** - The DIR-412 provides up to 150Mbps* wireless connection with other 802.11n wireless clients. This capability allows users to participate in real-time activities online, such as video streaming, online gaming, and real-time audio.

- **Compatible with 802.11g Devices** - The DIR-412 is still fully compatible with the IEEE 802.11g standard, so it can connect with existing 802.11g PCI, USB and Cardbus adapters.

- **3G Internet Connection Support** - Connect a 3G USB adapter to the DIR-412 to access 3G Internet Services.

- **Advanced Firewall Features** - The Web-based user interface displays a number of advanced network management features including:

    - **Content Filtering** - Easily applied content filtering based on MAC Address, URL, and/or Domain Name.

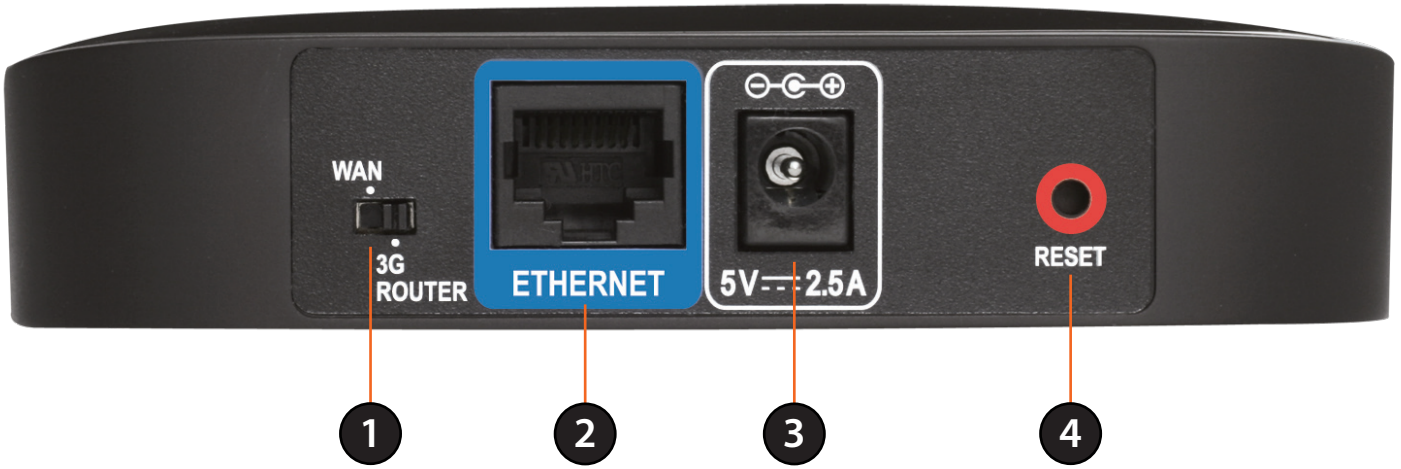
    - **Filter Scheduling** - These filters can be scheduled to be active on certain days or for a duration of hours or minutes.

    - **Secure Multiple/Concurrent Sessions** - The DIR-412 can pass through VPN sessions. It supports multiple and concurrent IPSec, PPTP, and L2TP sessions, so users behind the DIR-412 can securely access corporate networks.

- **User-friendly Setup Wizard** - Through its easy-to-use Web-based user interface, the DIR-412 lets you control what information is accessible to those on the wireless network, whether from the Internet or from your company's server. Configure your router to your specific settings within minutes.

* Maximum wireless signal rate derived from IEEE Standard 802.11g and 802.11n specifications. Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate. Environmental conditions will adversely affect wireless signal range.

Hardware Overview
Connections



1	**Mode Switch**	Use this switch to change between WAN mode and 3G Router mode.
2	**Ethernet Port**	In WAN mode the Ethernet port is used to connect to your WAN connection. In 3G mode the Ethernet port is used to connect to your LAN connection.
3	**Power Receptor**	Receptor for the supplied power adapter.
4	**Reset**	Pressing the Reset button restores the router to its original factory default settings.

Hardware Overview

Top View

1	**Power LED**	Lights orange during bootup. Lights green when router has booted up. A solid green light indicates a proper connection to the power supply. If the LED blinks orange the system has failed.
2	**Internet LED**	A solid green light indicates a successful 3G connection. A solid orange light indicates a 3G error, a WAN failure, or a system failure. A blinking green light indicates that the WAN connection is enabled when the Router is operating in WAN mode.
3	**WLAN LED**	A solid green light indicates that the wireless segment is ready. This LED blinks during wireless data transmission.
4	**Ethernet LED**	A solid green light indicates that a link has been established. This LED blinks during data transmission.
5	**WPS Button**	Press the WPS button for 1 second to initiate the WPS process. The button will flash blue while a WPS connection is being established. The button will light blue for 120 seconds (2 minutes) if a successful WPS connection has been made.
6	**3G USB Connection**	Connect your 3G USB adapter to this port if you want to use a 3G Internet connection.

Hardware Overview

Switching Between WAN Mode/3G Router Mode

The DIR-412 features a hardware switch that enables users to switch between WAN mode and 3G router mode.

When the DIR-412 is operating in WAN mode, WAN connectivity is achieved via the DIR-412's Ethernet port. In this mode LAN clients need to access the DIR-412 via the DIR-412's wireless connection. When the DIR-412 is operating in WAN mode network connectivity is more resilient as Internet connectivity can be failed over to a backup 3G connection, if the main WAN connection fails.

When the DIR-412 is in 3G router mode, LAN clients can access the DIR-412 via the DIR-412's Ethernet connection, as well as via the wireless connection.

Installation

This section will walk you through the installation process. Placement of the router is very important. Do not place the router in an enclosed area such as a closet, cabinet, or in the attic or garage.

Before you Begin

- Please configure the router with the computer that was last connected directly to your modem.
- You can only use the Ethernet port or 3G adapter. If you were using an USB broadband modem before using the router, then you must turn off your modem, disconnect the USB cable and connect an Ethernet cable to the Ethernet port on the router, and then turn the modem back on. In some cases, you may need to call your ISP to change connection types (USB to Ethernet).
- If you have DSL and are connecting via PPPoE, make sure you disable or uninstall any PPPoE software such as WinPoet, Broadjump, or Enternet 300 from your computer or you will not be able to connect to the Internet.

Wireless Installation Considerations

The D-Link wireless router lets you access your network using a wireless connection from virtually anywhere within the operating range of your wireless network. Keep in mind, however, that the number, thickness and location of walls, ceilings, or other objects that the wireless signals must pass through, may limit the range. Typical ranges vary depending on the types of materials and background RF (radio frequency) noise in your home or business. The key to maximizing wireless range is to follow these basic guidelines:

1. Keep the number of walls and ceilings between the D-Link router and other network devices to a minimum - each wall or ceiling can reduce your adapter's range from 3-90 feet (1-30 meters.) Position your devices so that the number of walls or ceilings is minimized.

2. Be aware of the direct line between network devices. A wall that is 1.5 feet thick (.5 meters), at a 45-degree angle appears to be almost 3 feet (1 meter) thick. At a 2-degree angle it looks over 42 feet (14 meters) thick! Position devices so that the signal will travel straight through a wall or ceiling (instead of at an angle) for better reception.

3. Building Materials make a difference. A solid metal door or aluminum studs may have a negative effect on range. Try to position access points, wireless routers, and computers so that the signal passes through drywall or open doorways. Materials and objects such as glass, steel, metal, walls with insulation, water (fish tanks), mirrors, file cabinets, brick, and concrete will degrade your wireless signal.

4. Keep your product away (at least 3-6 feet or 1-2 meters) from electrical devices or appliances that generate RF noise.

5. If you are using 2.4GHz cordless phones or X-10 (wireless products such as ceiling fans, lights, and home security systems), your wireless connection may degrade dramatically or drop completely. Make sure your 2.4GHz phone base is as far away from your wireless devices as possible. The base transmits a signal even if the phone in not in use.

Connect to Cable/DSL (WAN Mode)

If your Internet connection is provided using a cable/DSL/satellite modem, follow the steps below before connecting the router to a cable/DSL/satellite modem:

- If you are using the DIR-412 for the first time, please select the **3G Router** mode first to configure your wireless settings. Refer to the **Wireless Settings** section for more information.
- After configuring the wireless settings, move the switch to the **WAN Mode** position and wait for the device to reboot.

To connect to a broadband modem, or an Ethernet Internet connection such as in a hotel, please follow the steps below:

1. Unplug the Ethernet cable (that connects your computer to your modem) from your computer and place it into the Ethernet port on the router, or connect an Ethernet cable from the Internet port to the Ethernet port on the router.

2. Plug the power adapter into the router and connect it to an outlet or power strip. Wait about 50 seconds for the router to boot.

3. Connect the DIR-412 to your computer wirelessly using the settings (SSID, encryption key) you configured previously.

4. Verify the link lights on the router. The power light, Internet light, and the Wireless LAN light should be lit. If not, make sure your computer, modem, and router are powered on and verify the cable connections are correct.

Connect to a 3G Internet Service

If you are using a 3G USB adapter to connect to the Internet, please follow the steps below:

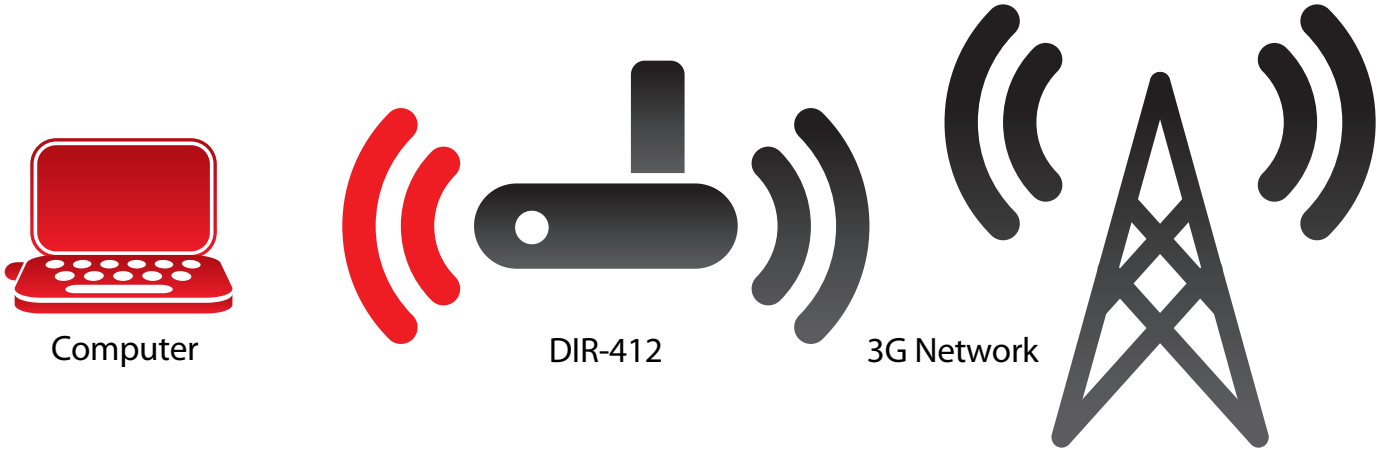
1. Move the toggle switch to the **3G Router** mode position and wait for the DIR-412 to reboot.

2. Insert your 3G USB adapter into the DIR-412's 3G USB port. In most cases, the 3G adapter will automatically configure and connect to the Internet. This process may take up to one minute. Refer to **http://www.dlink.com/DIR-412** for a compatiblility list of supported 3G adapters.

3. Plug one end of Ethernet cable into the DIR-412 and the other end into your computer.

4. Verify the link lights on the router. The power light, Internet light, and the Wireless LAN light should be lit. If not, make sure your computer and router are powered on and verify the cable connections are correct.

Note: *The 3G default setting for the DIR-412 is auto-config and always-on reconnect mode. With this setting, the DIR-412 will connect to the Internet automatically. If you do not want the DIR-412 to connect automatically, please disable auto-config and change the reconnect mode to manual.*

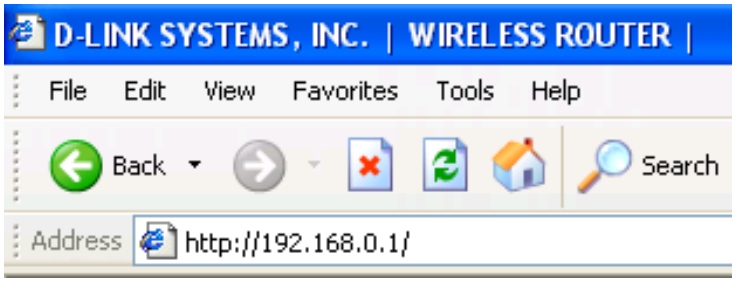


Configuration

This section will show you how to configure your new D-Link wireless router using the web-based configuration utility.

Web-based Configuration Utility

To access the configuration utility, open a web-browser such as Internet Explorer and enter the IP address of the router (192.168.0.1).



Type **Admin** in the **User Name** field and then enter your password. Leave the password blank by default.

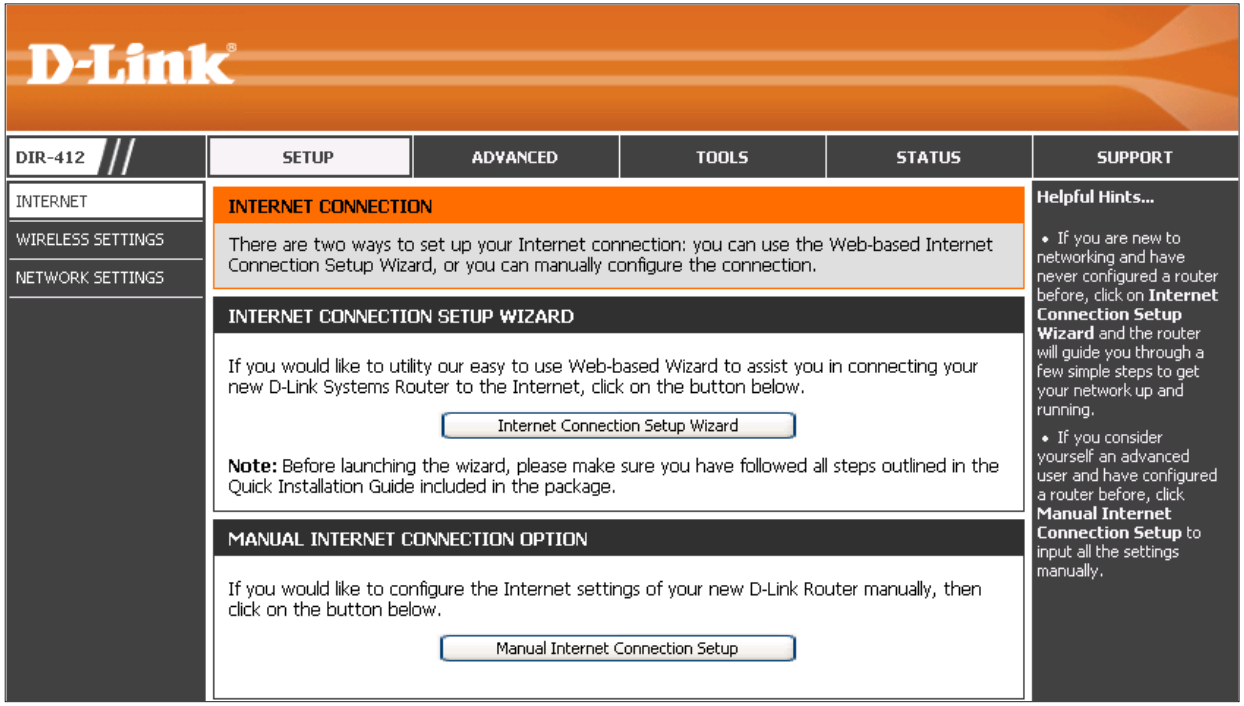
Click the **Login** button to log in to the router.

If you get a **Page Cannot be Displayed** error, please refer to the **Troubleshooting** section for assistance.

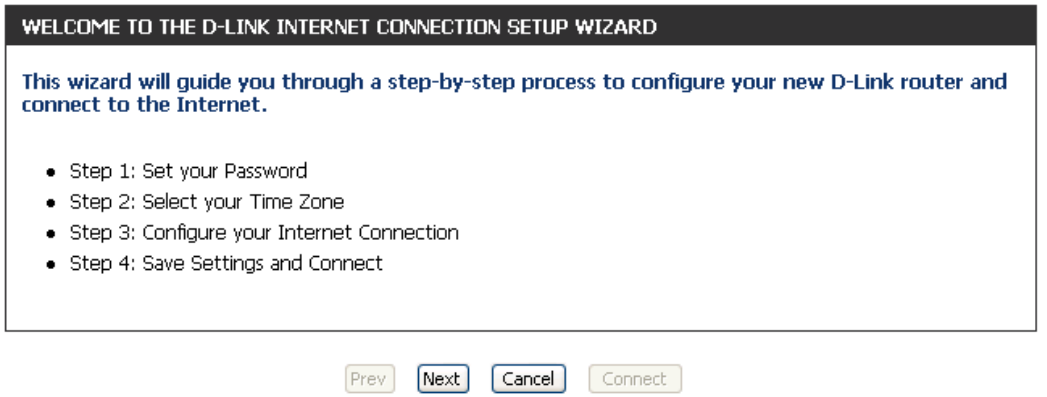
Internet Connection Setup Wizard (3G Mode)

Once logged into the web interface of the router, the **Setup > Internet** page will appear. Click the **Internet Connection Setup Wizard** button to quickly configure your router using the setup wizard.

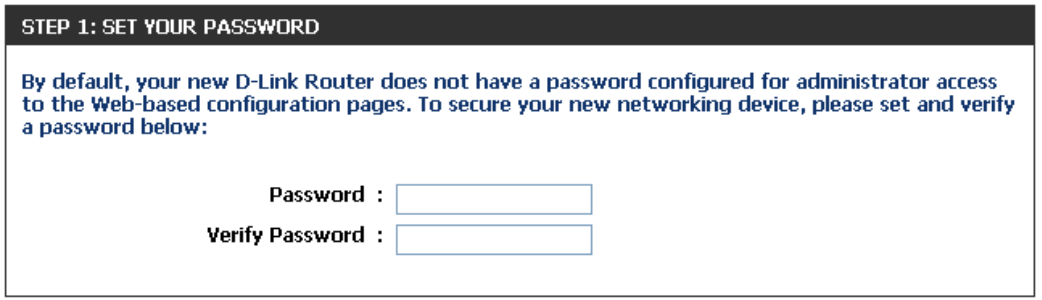
If you want to enter your settings without running the wizard, click **Manual Internet Connection Setup** and skip to "Manual Configuration (3G Mode)".


D-Link
DIR-412
SETUP
ADVANCED
TOOLS
STATUS
SUPPORT
INTERNET
WIRELESS SETTINGS
NETWORK SETTINGS
INTERNET CONNECTION
There are two ways to set up your Internet connection: you can use the Web-based Internet Connection Setup Wizard, or you can manually configure the connection.
INTERNET CONNECTION SETUP WIZARD
If you would like to utility our easy to use Web-based Wizard to assist you in connecting your new D-Link Systems Router to the Internet, click on the button below.
Internet Connection Setup Wizard
Note: Before launching the wizard, please make sure you have followed all steps outlined in the Quick Installation Guide included in the package.
MANUAL INTERNET CONNECTION OPTION
If you would like to configure the Internet settings of your new D-Link Router manually, then click on the button below.
Manual Internet Connection Setup
Helpful Hints...
• If you are new to networking and have never configured a router before, click on Internet Connection Setup Wizard and the router will guide you through a few simple steps to get your network up and running.
• If you consider yourself an advanced user and have configured a router before, click Manual Internet Connection Setup to input all the settings manually.

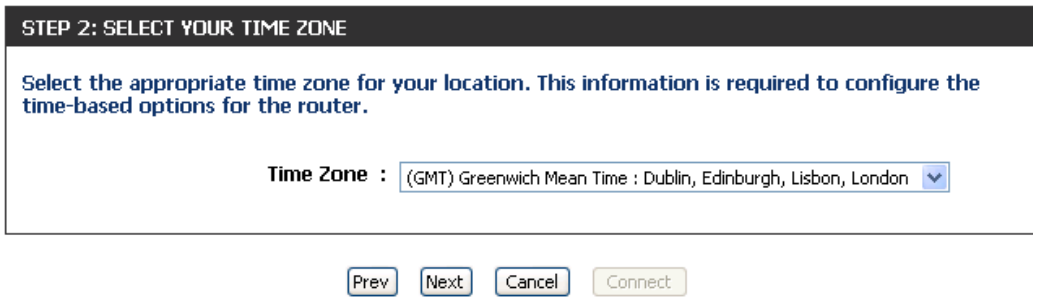
Click **Next** to continue.


WELCOME TO THE D-LINK INTERNET CONNECTION SETUP WIZARD
This wizard will guide you through a step-by-step process to configure your new D-Link router and connect to the Internet.
Step 1: Set your Password
Step 2: Select your Time Zone
Step 3: Configure your Internet Connection
Step 4: Save Settings and Connect
Prev
Next
Cancel
Connect

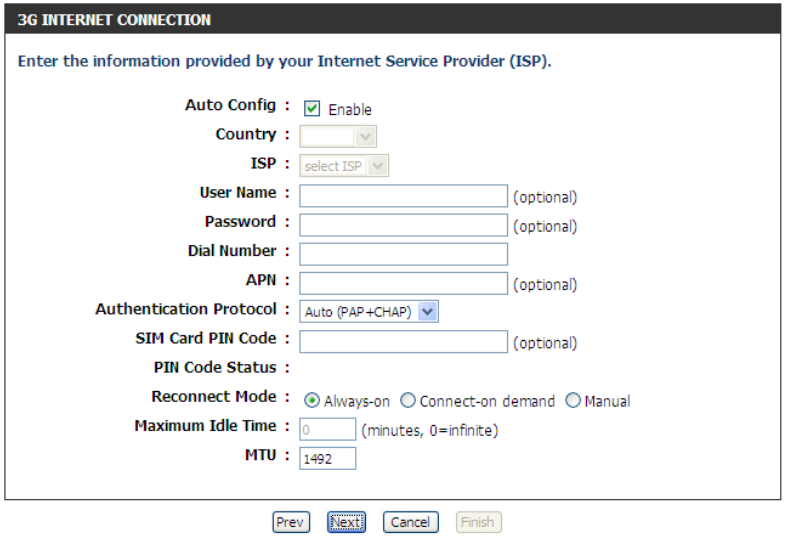
Create a new password and then click **Next** to continue.


STEP 1: SET YOUR PASSWORD
By default, your new D-Link Router does not have a password configured for administrator access to the Web-based configuration pages. To secure your new networking device, please set and verify a password below:
Password :
Verify Password :

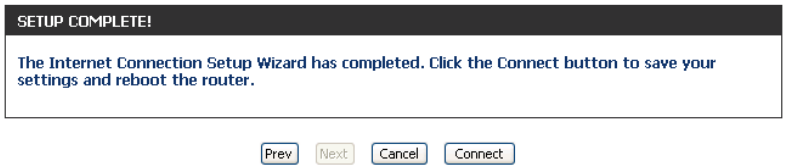
Select your time zone from the drop-down menu and then click **Next** to continue.


STEP 2: SELECT YOUR TIME ZONE
Select the appropriate time zone for your location. This information is required to configure the time-based options for the router.
Time Zone :
(GMT) Greenwich Mean Time : Dublin, Edinburgh, Lisbon, London
Prev
Next
Cancel
Connect

Configure your 3G Internet Connection settings and then click **Next** to continue.


3G INTERNET CONNECTION
Enter the information provided by your Internet Service Provider (ISP).
Auto Config : Enable
Country :
ISP : select ISP
User Name : (optional)
Password : (optional)
Dial Number :
APN : (optional)
Authentication Protocol : Auto (PAP+CHAP)
SIM Card PIN Code : (optional)
PIN Code Status :
Reconnect Mode : Always-on Connect-on demand Manual
Maximum Idle Time : 0 (minutes, 0=infinite)
MTU : 1492
Prev Next Cancel Finish

Click **Connect** to save your settings. Once the router has finished rebooting, click **Continue**. Please allow 1-2 minutes to connect.

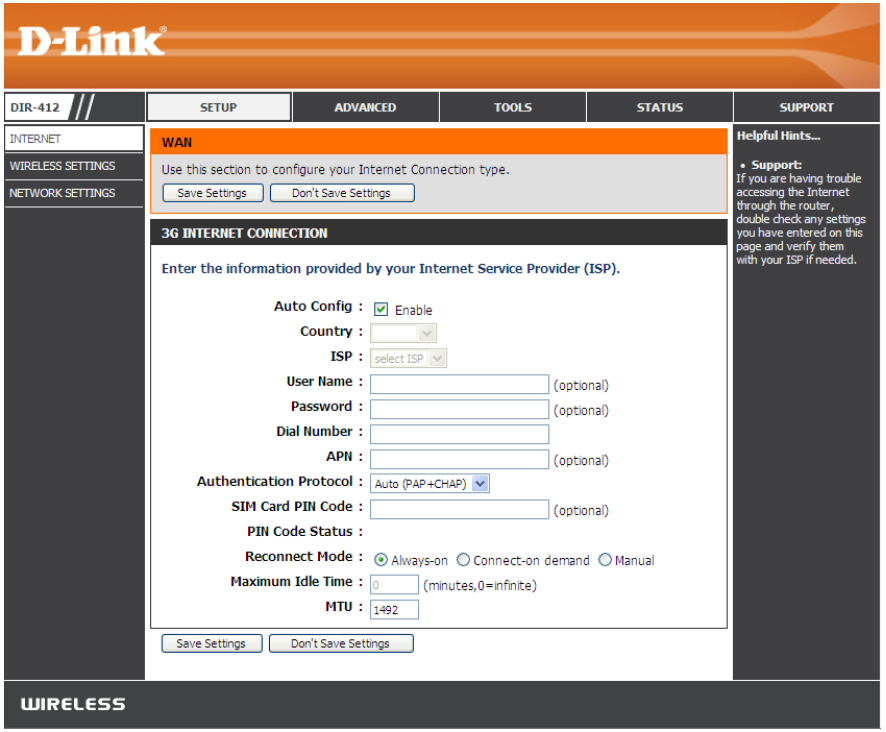

SETUP COMPLETE!
The Internet Connection Setup Wizard has completed. Click the Connect button to save your settings and reboot the router.
Prev Next Cancel Connect

Note: Before choosing 3G mode, make sure that your SIM card is activated. If your SIM card is protected by a personal identification number (PIN), we suggest you unlock and remove the PIN first. If you decide to set a PIN for the DIR-412, you need to input the PIN settings using the wizard or web configuration. The PIN detection status is shown in below table.

	PIN set for SIM card	**No PIN set for SIM card**
Detection	Detecting PIN (blue words).	
Detection result	SIM card is locked (red words).	SIM card is unlocked (green words).
PIN input	**Right PIN**: SIM card is ready (green text). **Wrong PIN**: PIN code is wrong (red text). **3x wrong PIN**: SIM card is locked by PUK (red text).	

Manual Configuration (3G Mode)
3G Internet Connection

If you opt to set up your Internet connection manually, you will be redirected to a WAN page that allows you to configure your 3G configuration parameters.



Auto-config: Select whether or not to automatically configure your 3G Internet connection parameter.

Country: Select your country from the drop-down menu.

ISP: Select your Internet Service Provider (ISP) from the drop-down menu.

User Name: Enter the user name for your 3G Internet connection.

Password: Enter the password for your 3G Internet connection.

Dial Number: Enter the dial number for your 3G service provider.

APN: Enter the Access Point Name (APN) for your 3G service provider.

Authentication Protocol: Select the protocol from the drop-down menu.

SIM Card PIN Code: Enter your PIN.

PIN Status: Displays the PIN detection status.

Maximum Idle Time: Enter the maximum amount of time the Internet connection should be maintained during inactivity. To disable this feature, enable the **Always-on** reconnect mode.

MTU: Maximum Transmission Unit. You may need to change the MTU for optimal performance with your specific ISP. The default is 1500.

Internet Connection Setup Wizard (WAN Mode)

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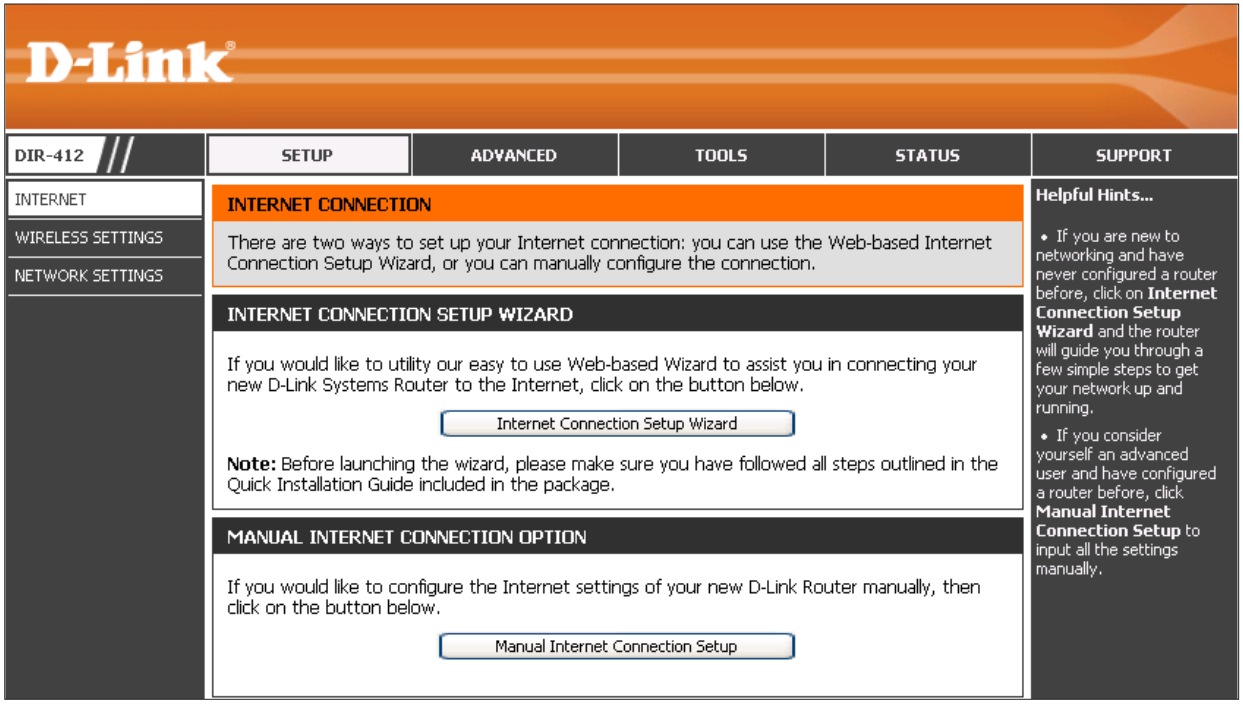
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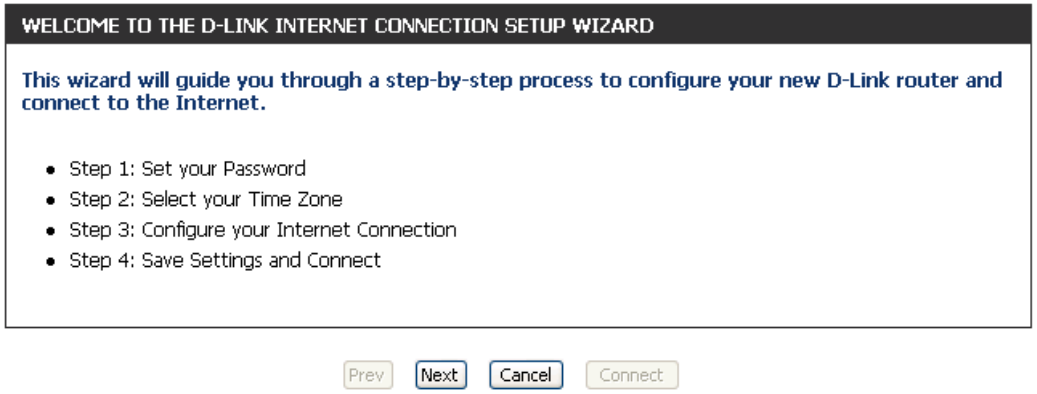
Click **Next** to continue.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Step 1: Set your Password
Step 2: Select your Time Zone
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Step 4: Save Settings and Connect
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Next
Cancel
Connect

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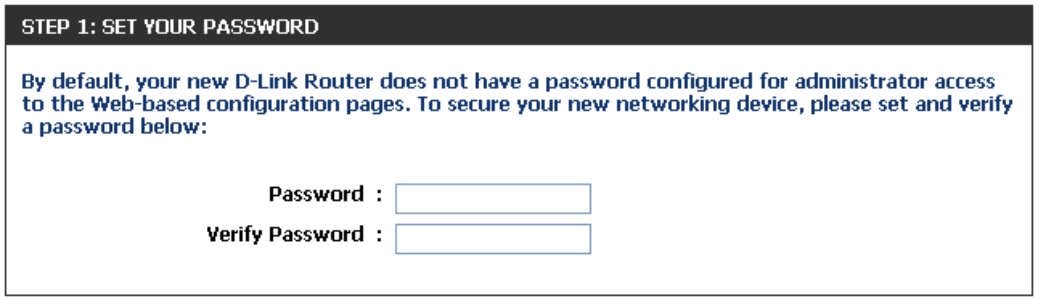
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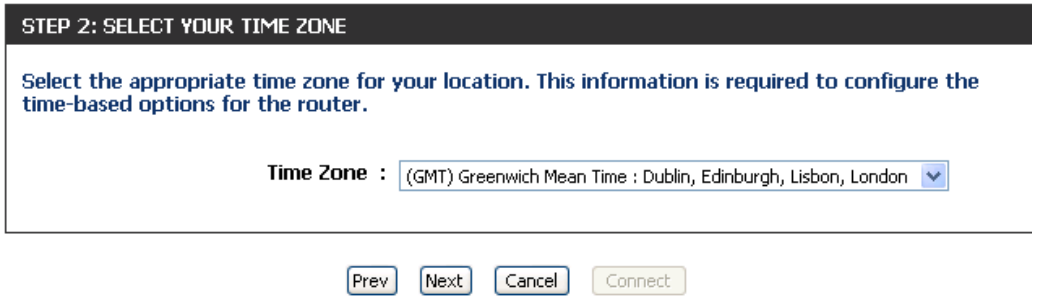
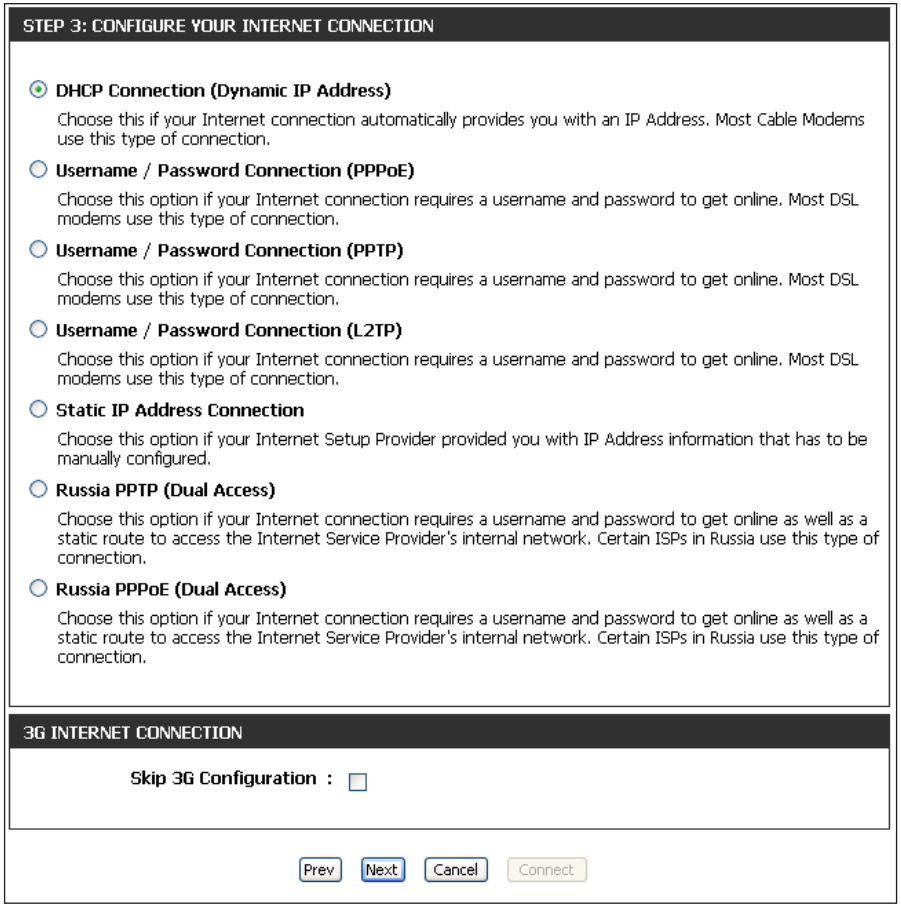
Password :
Verify Password :

Select your time zone from the drop-down menu and then click **Next** to continue.


STEP 2: SELECT YOUR TIME ZONE
Select the appropriate time zone for your location. This information is required to configure the time-based options for the router.
Time Zone :
(GMT) Greenwich Mean Time : Dublin, Edinburgh, Lisbon, London
Prev
Next
Cancel
Connect

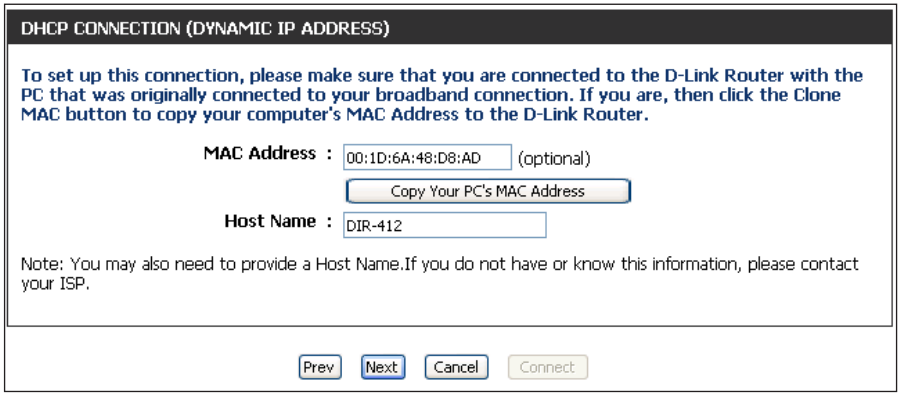
Select the type of Internet connection you will use on your WAN connection. If using the DIR-412 for the first time, leave the **Skip 3G Configuration** box unchecked. Check the **Skip 3G Configuration** box if you do not want to configure the router's 3G connection.

Click **Next** to continue.


STEP 3: CONFIGURE YOUR INTERNET CONNECTION
DHCP Connection (Dynamic IP Address)
Choose this if your Internet connection automatically provides you with an IP Address. Most Cable Modems use this type of connection.
Username / Password Connection (PPPoE)
Choose this option if your Internet connection requires a username and password to get online. Most DSL modems use this type of connection.
Username / Password Connection (PPTP)
Choose this option if your Internet connection requires a username and password to get online. Most DSL modems use this type of connection.
Username / Password Connection (L2TP)
Choose this option if your Internet connection requires a username and password to get online. Most DSL modems use this type of connection.
Static IP Address Connection
Choose this option if your Internet Setup Provider provided you with IP Address information that has to be manually configured.
Russia PPTP (Dual Access)
Choose this option if your Internet connection requires a username and password to get online as well as a static route to access the Internet Service Provider's internal network. Certain ISPs in Russia use this type of connection.
Russia PPPoE (Dual Access)
Choose this option if your Internet connection requires a username and password to get online as well as a static route to access the Internet Service Provider's internal network. Certain ISPs in Russia use this type of connection.
3G INTERNET CONNECTION
Skip 3G Configuration :
Prev
Next
Cancel
Connect

If you selected Dynamic IP Address, you may need to enter the MAC address of the computer that was last connected directly to your modem. If you are currently using that computer, click **Copy Your PC's MAC Address** and then click **Next** to continue.

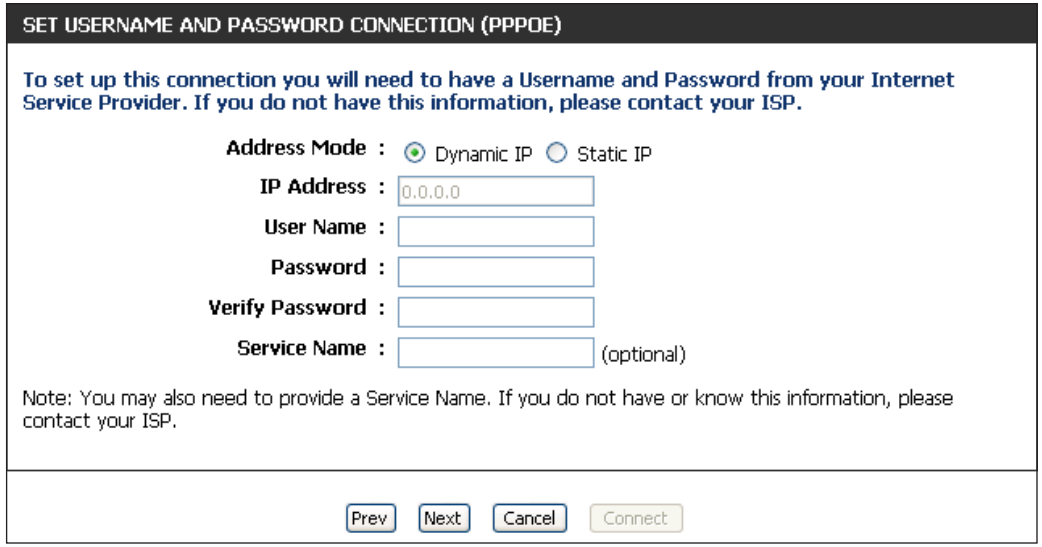
The Host Name is optional but may be required by some ISPs. The default host name is **DIR-412**.


DHCP CONNECTION (DYNAMIC IP ADDRESS)
To set up this connection, please make sure that you are connected to the D-Link Router with the PC that was originally connected to your broadband connection. If you are, then click the Clone MAC button to copy your computer's MAC Address to the D-Link Router.
MAC Address :
00:1D:6A:48:D8:AD
(optional)
Copy Your PC's MAC Address
Host Name :
DIR-412
Note: You may also need to provide a Host Name.If you do not have or know this information, please contact your ISP.
Prev
Next
Cancel
Connect

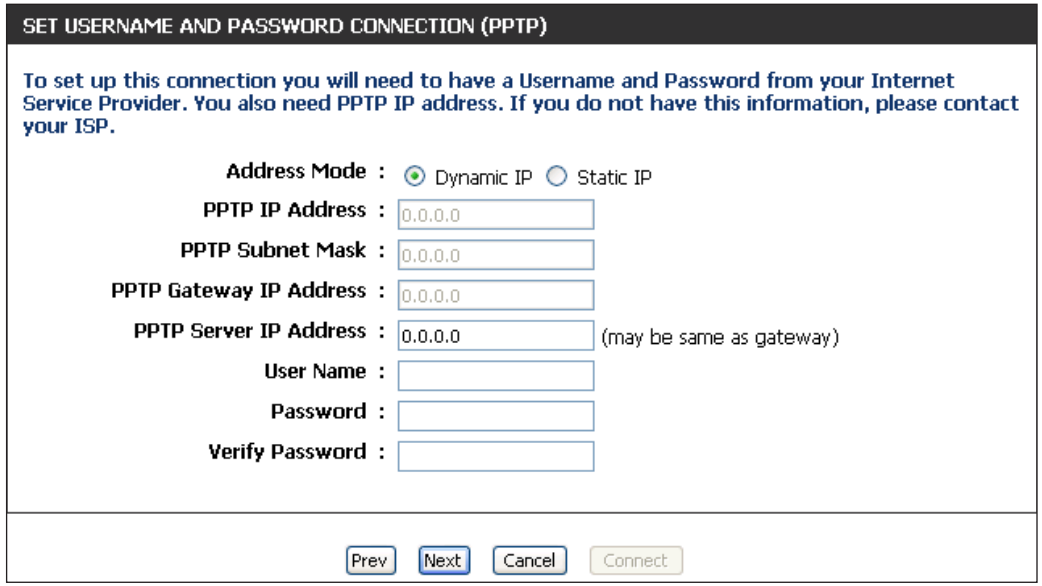
If you selected PPPoE, enter your PPPoE username and password. Click **Next** to continue.

Select **Static** if your ISP assigned you the IP address, subnet mask, gateway, and DNS server addresses.

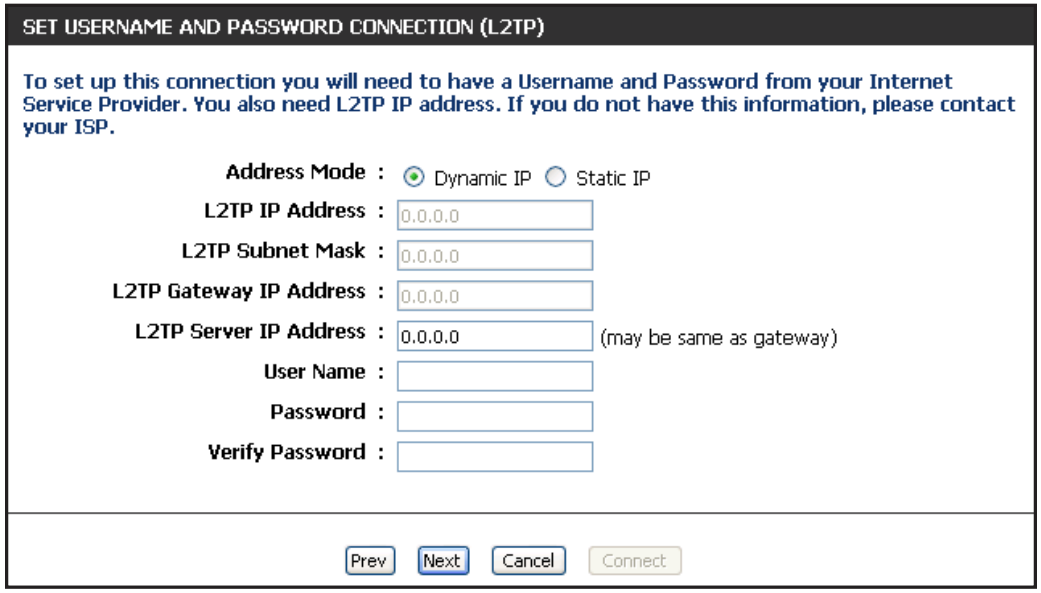
Note: Make sure to remove your PPPoE software from your computer. The software is no longer needed and will not work through a router.


SET USERNAME AND PASSWORD CONNECTION (PPPOE)
To set up this connection you will need to have a Username and Password from your Internet Service Provider. If you do not have this information, please contact your ISP.
Address Mode :
Dynamic IP
Static IP
IP Address :
0.0.0.0
User Name :
Password :
Verify Password :
Service Name :
(optional)
Note: You may also need to provide a Service Name. If you do not have or know this information, please contact your ISP.
Prev
Next
Cancel
Connect

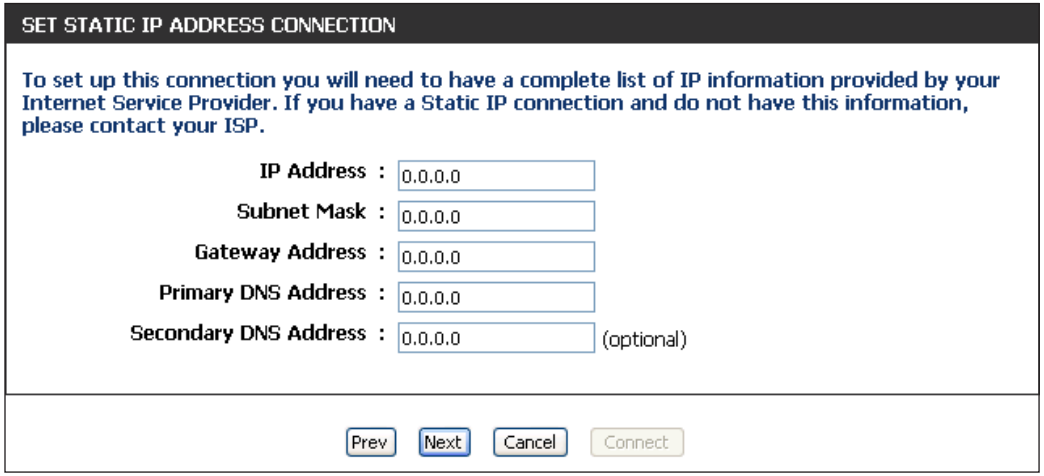
If you selected PPTP, enter your PPTP username and password. Click **Next** to continue.


SET USERNAME AND PASSWORD CONNECTION (PPTP)
To set up this connection you will need to have a Username and Password from your Internet Service Provider. You also need PPTP IP address. If you do not have this information, please contact your ISP.
Address Mode :
Dynamic IP
Static IP
PPTP IP Address :
0.0.0.0
PPTP Subnet Mask :
0.0.0.0
PPTP Gateway IP Address :
0.0.0.0
PPTP Server IP Address :
0.0.0.0
(may be same as gateway)
User Name :
Password :
Verify Password :
Prev
Next
Cancel
Connect

If you selected L2TP, enter your L2TP username and password. Click **Next** to continue.

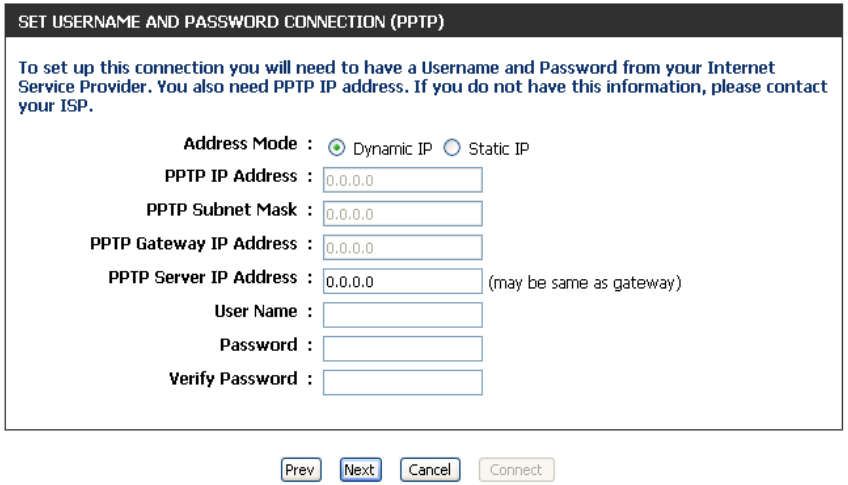

SET USERNAME AND PASSWORD CONNECTION (L2TP)
To set up this connection you will need to have a Username and Password from your Internet Service Provider. You also need L2TP IP address. If you do not have this information, please contact your ISP.
Address Mode :
Dynamic IP
Static IP
L2TP IP Address :
0.0.0.0
L2TP Subnet Mask :
0.0.0.0
L2TP Gateway IP Address :
0.0.0.0
L2TP Server IP Address :
0.0.0.0
(may be same as gateway)
User Name :
Password :
Verify Password :
Prev
Next
Cancel
Connect

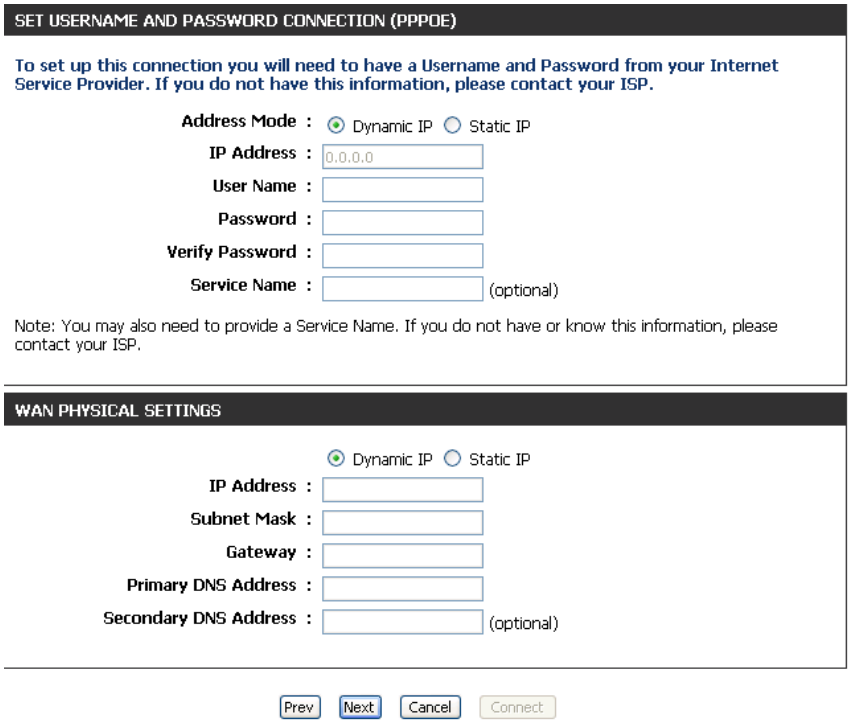
If you selected Static IP Address Connection, enter the network settings supplied by your Internet provider. Click **Next** to continue.


SET STATIC IP ADDRESS CONNECTION
To set up this connection you will need to have a complete list of IP information provided by your Internet Service Provider. If you have a Static IP connection and do not have this information, please contact your ISP.
IP Address :
0.0.0.0
Subnet Mask :
0.0.0.0
Gateway Address :
0.0.0.0
Primary DNS Address :
0.0.0.0
Secondary DNS Address :
0.0.0.0
(optional)
Prev
Next
Cancel
Connect

Russia PPTP (dual mode) and **Russia PPPoE (dual mode)** are specifically for Russian users. Please fill in the username and password given by Russia ISPs and click **Next** to continue.

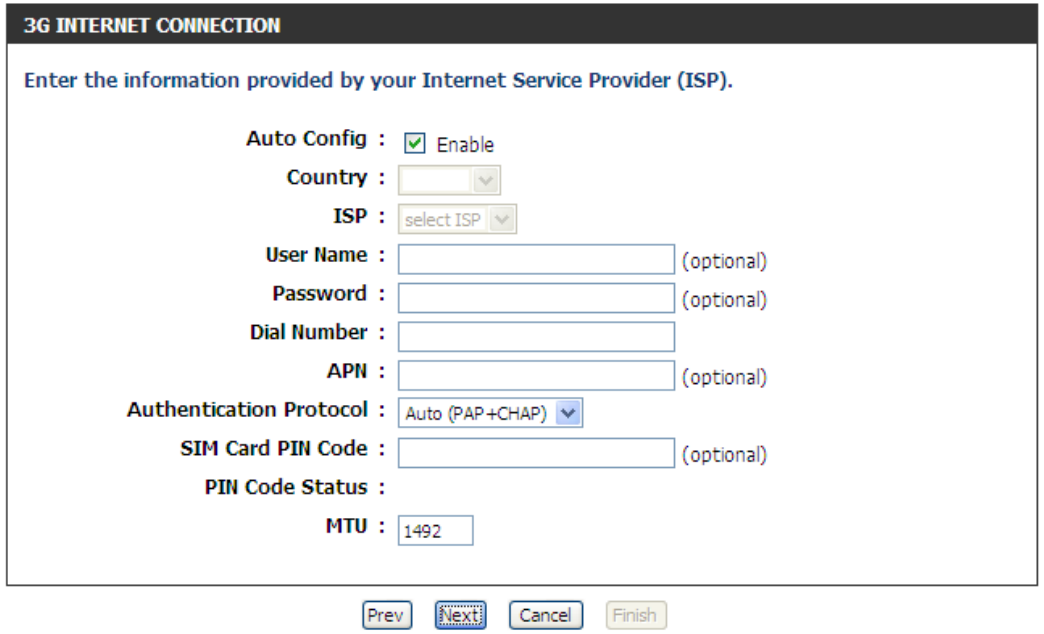
Other users may ignore these 2 settings.


SET USERNAME AND PASSWORD CONNECTION (PPTP)
To set up this connection you will need to have a Username and Password from your Internet Service Provider. You also need PPTP IP address. If you do not have this information, please contact your ISP.
Address Mode :
Dynamic IP
Static IP
PPTP IP Address :
0.0.0.0
PPTP Subnet Mask :
0.0.0.0
PPTP Gateway IP Address :
0.0.0.0
PPTP Server IP Address :
0.0.0.0
(may be same as gateway)
User Name :
Password :
Verify Password :
Prev
Next
Cancel
Connect

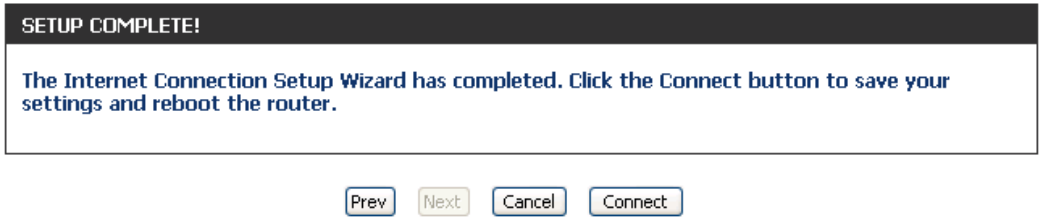

SET USERNAME AND PASSWORD CONNECTION (PPPOE)
To set up this connection you will need to have a Username and Password from your Internet Service Provider. If you do not have this information, please contact your ISP.
Address Mode :
Dynamic IP
Static IP
IP Address :
0.0.0.0
User Name :
Password :
Verify Password :
Service Name :
(optional)
Note: You may also need to provide a Service Name. If you do not have or know this information, please contact your ISP.
WAN PHYSICAL SETTINGS
Dynamic IP
Static IP
IP Address :
Subnet Mask :
Gateway :
Primary DNS Address :
Secondary DNS Address :
(optional)
Prev
Next
Cancel
Connect

If you left the **Skip 3G Configuration** checkbox unchecked in **Step 3** of the **Internet Connection Setup Wizard**, the following window appears:

Configure the parameters for your 3G Internet Connection and click next to **Continue**.



Click **Connect** to save your settings and reboot the router. Please allow 1-2 minutes to connect.


SETUP COMPLETE!
The Internet Connection Setup Wizard has completed. Click the Connect button to save your settings and reboot the router.
Prev
Next
Cancel
Connect

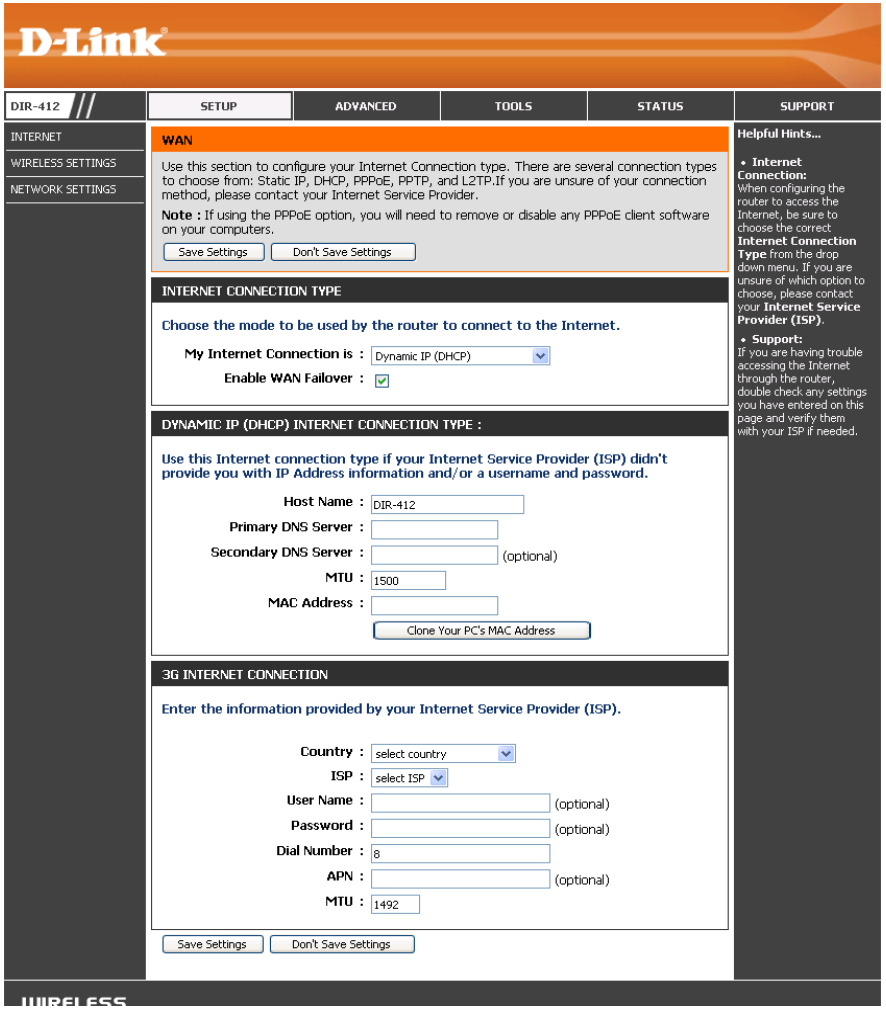
Manual Configuration (WAN Mode)

If you opt to set up your Internet connection manually, you will be redirected to a WAN page that allows you to select your Internet type and enter the correct configuration parameters.

Internet Connection Type: Select your Internet connection type using the "**My Internet Connection is:**" drop-down menu. To enable the Router to connect to the Internet via the 3G Internet connection in the event that the WAN connection fails, check the **Enable WAN Failover** box. Configure the parameters for your WAN connection in the section below the **Internet Connection Type** section as described in the following pages.

3G Internet Connection: If enabling the WAN Failover feature, configure the parameters for your 3G Internet Connection.

Click the **Save Settings** button when you have finished configuring the WAN connection.


D-Link
DIR-412
SETUP
ADVANCED
TOOLS
STATUS
SUPPORT
INTERNET
WIRELESS SETTINGS
NETWORK SETTINGS
WAN
Use this section to configure your Internet Connection type. There are several connection types to choose from: Static IP, DHCP, PPPoE, PPTP, and L2TP.If you are unsure of your connection method, please contact your Internet Service Provider.
Note : If using the PPPoE option, you will need to remove or disable any PPPoE client software on your computers.
Save Settings
Don't Save Settings
INTERNET CONNECTION TYPE
Choose the mode to be used by the router to connect to the Internet.
My Internet Connection is :
Dynamic IP (DHCP)
Enable WAN Failover :
DYNAMIC IP (DHCP) INTERNET CONNECTION TYPE :
Use this Internet connection type if your Internet Service Provider (ISP) didn't provide you with IP Address information and/or a username and password.
Host Name :
DIR-412
Primary DNS Server :
Secondary DNS Server :
(optional)
MTU :
1500
MAC Address :
Clone Your PC's MAC Address
3G INTERNET CONNECTION
Enter the information provided by your Internet Service Provider (ISP).
Country :
select country
ISP :
select ISP
User Name :
(optional)
Password :
(optional)
Dial Number :
8
APN :
(optional)
MTU :
1492
Save Settings
Don't Save Settings
Helpful Hints...
• Internet Connection:
When configuring the router to access the Internet, be sure to choose the correct Internet Connection Type from the drop down menu. If you are unsure of which option to choose, please contact your Internet Service Provider (ISP).
• Support:
If you are having trouble accessing the Internet through the router, double check any settings you have entered on this page and verify them with your ISP if needed.
WIRELESS

Manual Configuration (WAN Mode)
Static IP Address

Choose **Static IP (DHCP)** from the **My Internet Connection is** drop-down menu if all the Internet port's IP information is provided to you by your ISP. You will need to enter in the IP address, subnet mask, gateway address, and DNS address(es) provided to you by your ISP. Each IP address entered in the fields must be in the appropriate IP form, which are four octets separated by a dot (x.x.x.x). The Router will not accept the IP address if it is not in this format.

IP Address: Enter the IP address assigned by your ISP.

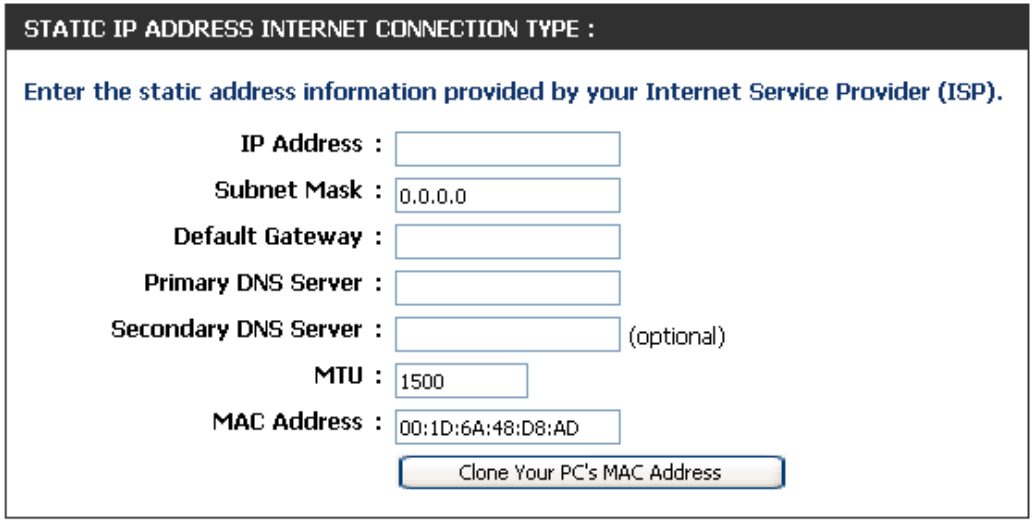
Subnet Mask: Enter the Subnet Mask assigned by your ISP.

Default Gateway: Enter the Gateway assigned by your ISP.

DNS Servers: Enter the Primary and Secondary DNS server IP addresses assigned by your ISP.

MTU: Maximum Transmission Unit - You may need to change the MTU for optimal performance with your specific ISP. 1500 is the default MTU.

MAC Address: The default MAC Address is set to the Internet port's physical interface MAC address on the Broadband Router. It is not recommended that you change the default MAC address unless required by your ISP. You can use the **Clone Your PC's MAC Address** button to replace the Internet port's MAC address with the MAC address of your Ethernet card.



Manual Configuration (WAN Mode)
Dynamic IP Address (DHCP)

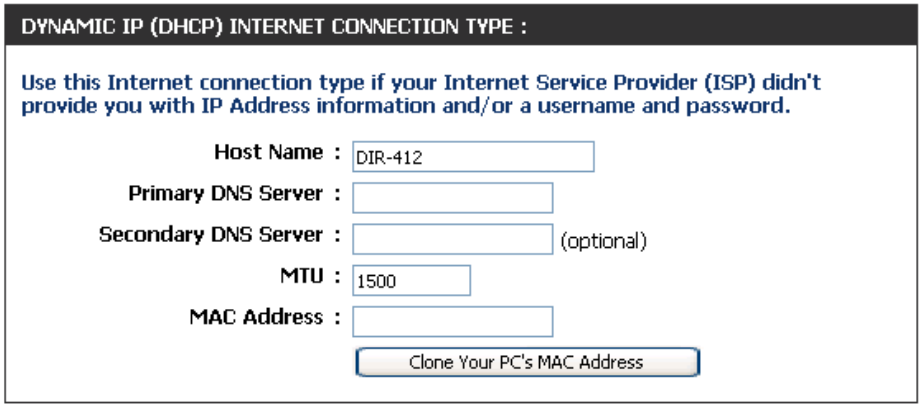
Choose **Dynamic IP (DHCP)** from the **My Internet Connection is** drop-down menu if all WAN IP information is obtained from your ISP.

Host Name: The Host Name is optional but may be required by some ISPs. The default host name is the device name of the Router and may be changed.

DNS Addresses: Enter the Primary and Secondary DNS server IP addresses assigned by your ISP.

MTU: Maximum Transmission Unit - you may need to change the MTU for optimal performance with your specific ISP. 1500 is the default MTU.

MAC Address: The default MAC Address is set to the Internet port's physical interface MAC address on the Broadband Router. It is not recommended that you change the default MAC address unless required by your ISP. You can use the **Clone Your PC's MAC Address** button to replace the Internet port's MAC address with the MAC address of your Ethernet card.


DYNAMIC IP (DHCP) INTERNET CONNECTION TYPE :
Use this Internet connection type if your Internet Service Provider (ISP) didn't provide you with IP Address information and/or a username and password.
Host Name :
DIR-412
Primary DNS Server :
Secondary DNS Server :
(optional)
MTU :
1500
MAC Address :
Clone Your PC's MAC Address

Manual Configuration (WAN Mode)
PPPoE (Username/Password)

Choose **PPPoE (Username/Password)** from the **My Internet Connection is** drop-down menu if your ISP uses a PPPoE connection. Your ISP will provide you with a username and password. This option is typically used for DSL services. Make sure to remove your PPPoE software from your computer. The software is no longer needed and will not work through a router.

Address Mode: Select **Static** if your ISP assigned you the IP address, subnet mask, gateway, and DNS server addresses. In most cases, select **Dynamic**.

IP Address: Enter the IP address (Static PPPoE only).

User Name: Enter your PPPoE user name.

Password: Enter your PPPoE password and then retype the password in the next box.

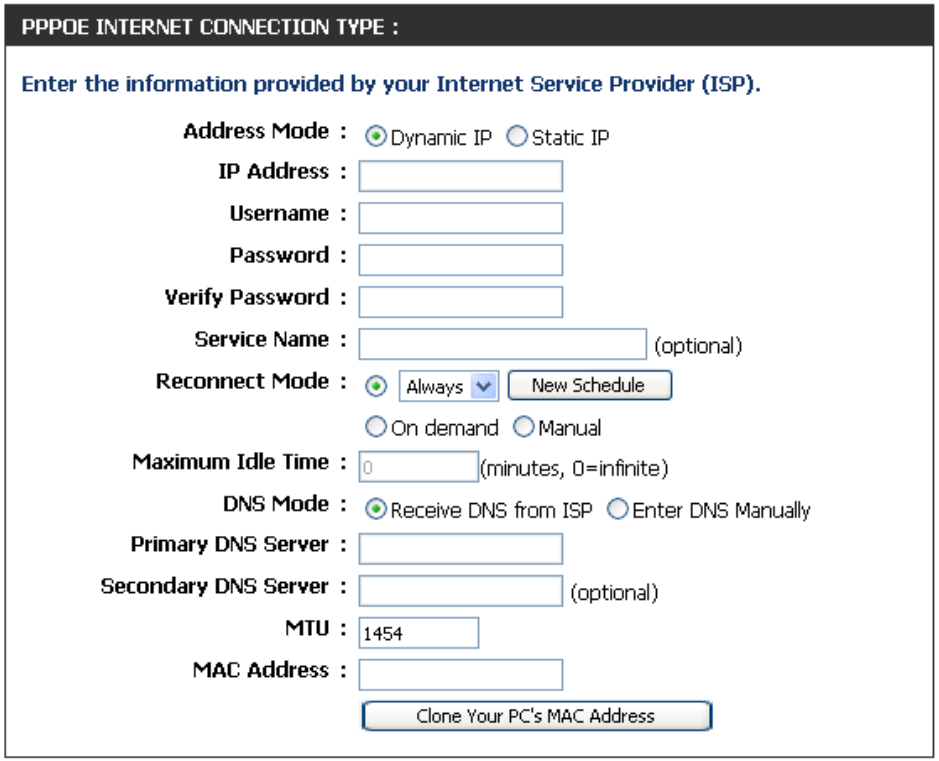
Service Name: Enter the ISP Service Name (optional).

Reconnect Mode: Select either **Always-on**, **On-Demand**, or **Manual**.

Maximum Idle Time: Enter a maximum idle time during which the Internet connection is maintained during inactivity. To disable this feature, enable Auto-reconnect.

DNS Mode:

Click the **Receive DNS from ISP** radio button if you want to dynamically receive the DNS Server IP addresses from your ISP. To manually enter the DNS Server IP addresses, click the **Enter DNS Manually** radio button and enter the DNS Server IP addresses in the **Primary DNS Server** and **Secondary DNS Server** fields.


PPPOE INTERNET CONNECTION TYPE :
Enter the information provided by your Internet Service Provider (ISP).
Address Mode : Dynamic IP Static IP
IP Address :
Username :
Password :
Verify Password :
Service Name : (optional)
Reconnect Mode : Always New Schedule
On demand Manual
Maximum Idle Time : 0 (minutes, 0=infinite)
DNS Mode : Receive DNS from ISP Enter DNS Manually
Primary DNS Server :
Secondary DNS Server : (optional)
MTU : 1454
MAC Address :
Clone Your PC's MAC Address

MTU: Maximum Transmission Unit - You may need to change the MTU for optimal performance with your specific ISP. 1492 is the default MTU.

MAC Address: The default MAC Address is set to the Internet port's physical interface MAC address on the Broadband Router. It is not recommended that you change the default MAC address unless required by your ISP. You can use the **Clone Your PC's MAC Address** button to replace the Internet port's MAC address with the MAC address of your Ethernet card.

Manual Configuration (WAN Mode)
PPTP (Username/Password)

Choose **PPTP (Username/Password)** from the **My Internet Connection is** drop-down menu if your ISP uses a PPTP connection. Your ISP will provide you with a username and password. This option is typically used for DSL services.

Address Mode: Select **Static** if your ISP assigned you the IP address, subnet mask, gateway, and DNS server addresses. In most cases, select **Dynamic**.

PPTP IP Address: Enter the IP address (Static PPTP only).

PPTP Subnet Mask: Enter the Subnet Mask (Static PPTP only).

PPTP Gateway IP Address: Enter the Gateway IP address provided by your ISP (Static PPTP only).

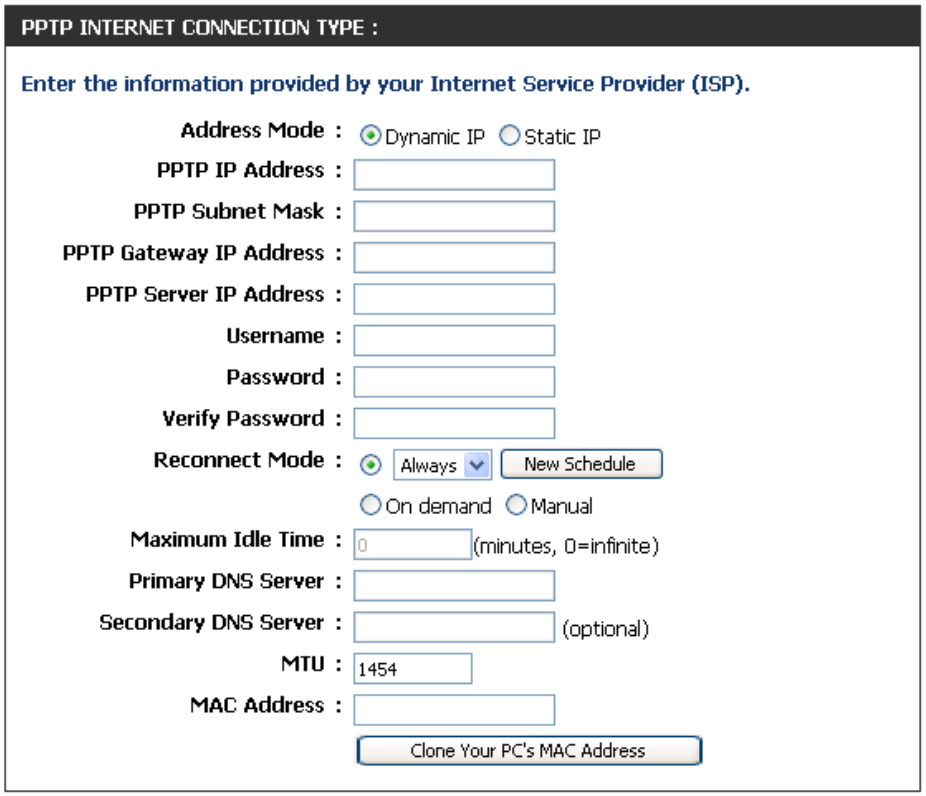
PPTP Server IP Address: Enter the Server IP provided by your ISP (optional).

Username: Enter your PPTP username.

Password: Enter your PPTP password and password in the next box.

Reconnect Mode: Select either **Always-on**, **On-Demand**, or **Manual**.

Maximum Idle Time: Enter a maximum idle time during which the Internet connection is maintained during inactivity. To disable this feature, enable Auto reconnect.


PPTP INTERNET CONNECTION TYPE :
Enter the information provided by your Internet Service Provider (ISP).
Address Mode : Dynamic IP Static IP
PPTP IP Address :
PPTP Subnet Mask :
PPTP Gateway IP Address :
PPTP Server IP Address :
Username :
Password :
Verify Password :
Reconnect Mode : Always New Schedule
On demand Manual
Maximum Idle Time : 0 (minutes, 0=infinite)
Primary DNS Server :
Secondary DNS Server : (optional)
MTU : 1454
MAC Address :
Clone Your PC's MAC Address

DNS Servers: Enter the Primary and Secondary DNS Server Addresses (Static PPTP only).

MTU: Maximum Transmission Unit - You may need to change the MTU for optimal performance with your specific ISP. 1400 is the default MTU.

MAC Address:

The default MAC Address is set to the Internet port's physical interface MAC address on the Broadband Router. It is not recommended that you change the default MAC address unless required by your ISP. You can use the **Clone Your PC's MAC Address** button to replace the Internet port's MAC address with the MAC address of your Ethernet card.

Manual Configuration (WAN Mode)

L2TP (Username/Password)

Choose **L2TP (Username/Password)** from the **My Internet Connection is** drop-down menu if your ISP uses an L2TP connection. Your ISP will provide you with a username and password. This option is typically used for DSL services.

Address Mode: Select **Static IP** if your ISP assigned you the IP address, subnet mask, gateway, and DNS server addresses. In most cases, select **Dynamic IP**.

L2TP IP Address: Enter the L2TP IP address supplied by your ISP (Static IP only).

L2TP Subnet Mask: Enter the Subnet Mask supplied by your ISP (Static L2TP only).

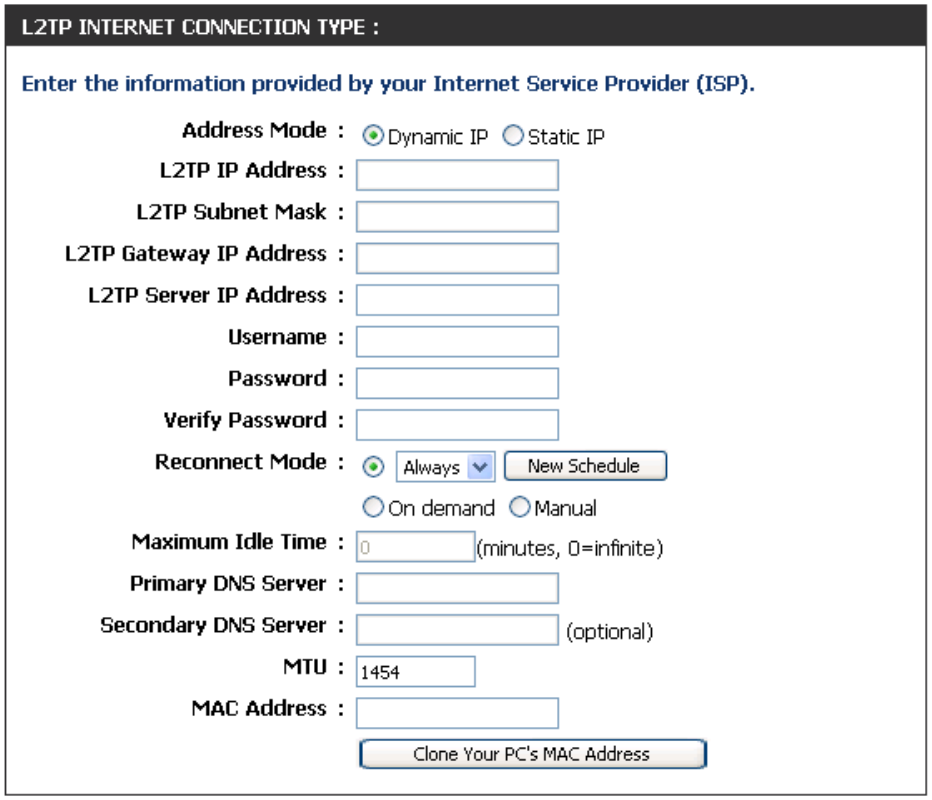
L2TP Gateway IP Address: Enter the Gateway IP address provided by your ISP (Static L2TP only).

L2TP Server IP Address: Enter the Server IP address provided by your ISP (optional).

User Name: Enter your L2TP user name.

Password: Enter your L2TP password and then retype the password in the next box.

Reconnect Mode: Select either **Always-on**, **On-Demand**, or **Manual**.


L2TP INTERNET CONNECTION TYPE :
Enter the information provided by your Internet Service Provider (ISP).
Address Mode : Dynamic IP Static IP
L2TP IP Address :
L2TP Subnet Mask :
L2TP Gateway IP Address :
L2TP Server IP Address :
Username :
Password :
Verify Password :
Reconnect Mode : Always New Schedule
On demand Manual
Maximum Idle Time : 0 (minutes, 0=infinite)
Primary DNS Server :
Secondary DNS Server : (optional)
MTU : 1454
MAC Address :
Clone Your PC's MAC Address

Maximum Idle Time: Enter a maximum idle time during which the Internet connection is maintained during inactivity. To disable this feature, enable Auto-reconnect.

DNS Servers: Enter the Primary and Secondary DNS Server Addresses (Static L2TP only).

MTU: Maximum Transmission Unit - You may need to change the MTU for optimal performance with your specific ISP. 1400 is the default MTU.

MAC Address:

The default MAC Address is set to the Internet port's physical interface MAC address on the Broadband Router. It is not recommended that you change the default MAC address unless required by your ISP. You can use the **Clone Your PC's MAC Address** button to replace the Internet port's MAC address with the MAC address of your Ethernet card.

Manual Configuration (WAN Mode)
Russia PPTP (Dual Access)

Choose **Russia PPTP (Dual Access)** from the **My Internet Connection is** drop-down menu if your ISP uses a PPTP connection. Your ISP will provide you with a username and password. This option is typically used for DSL services.

Address Mode: Select **Static IP** if your ISP assigned you the IP address, subnet mask, gateway, and DNS server addresses. In most cases, select **Dynamic IP**.

PPTP IP Address: Enter the IP address (Static PPTP only).

PPTP Subnet Mask: Enter the Subnet Mask (Static PPTP only).

PPTP Gateway IP Address: Enter the Gateway IP address provided by your ISP (Static PPTP only).

PPTP Server IP Address: Enter the Server IP provided by your ISP (optional).

Username:

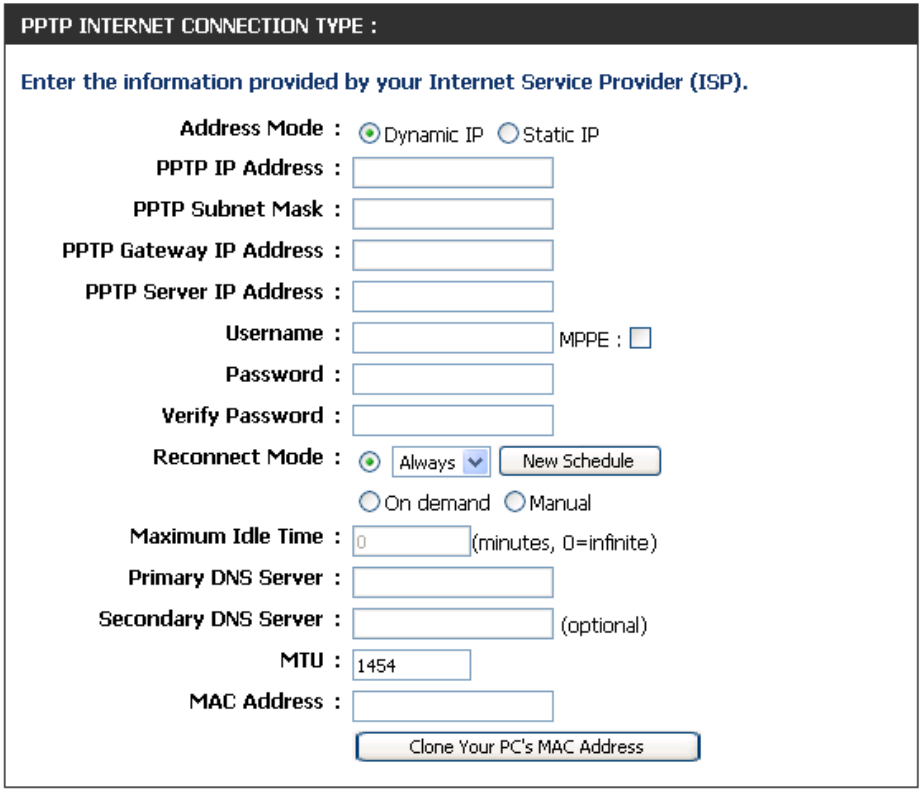
Enter your PPTP username. Check the **MPPE** box to enable the MPPE encryption protocol between the DIR-412 and PPTP server.

Password:

Enter your PPTP password and then retype the password in the next box.

Reconnect Mode:

Select either **Always-on**, **On-Demand**, or **Manual**.


PPTP INTERNET CONNECTION TYPE :
Enter the information provided by your Internet Service Provider (ISP).
Address Mode : Dynamic IP Static IP
PPTP IP Address :
PPTP Subnet Mask :
PPTP Gateway IP Address :
PPTP Server IP Address :
Username : MPPE :
Password :
Verify Password :
Reconnect Mode : Always New Schedule
On demand Manual
Maximum Idle Time : 0 (minutes, 0=infinite)
Primary DNS Server :
Secondary DNS Server : (optional)
MTU : 1454
MAC Address :
Clone Your PC's MAC Address

Maximum Idle Time: Enter a maximum idle time during which the Internet connection is maintained during inactivity. To disable this feature, enable Auto-reconnect.

DNS Servers: Enter the Primary and Secondary DNS Server Addresses (Static PPTP only).

MTU: Maximum Transmission Unit - You may need to change the MTU for optimal performance with your specific ISP. 1400 is the default MTU.

MAC Address: The default MAC Address is set to the Internet port's physical interface MAC address on the Broadband Router. It is not recommended that you change the default MAC address unless required by your ISP. You can use the **Clone Your PC's MAC Address** button to replace the Internet port's MAC address with the MAC address of your Ethernet card.

Manual Configuration (WAN Mode)

Russia PPPoE (Dual Access)

Choose **Russia PPoE (Dual Access)** from the **My Internet Connection is** drop-down menu if your ISP uses a PPPoE connection. Your ISP will provide you with a username and password. This option is typically used for DSL services.

Address Mode: Select **Static** if your ISP assigned you the IP address, subnet mask, gateway, and DNS server addresses. In most cases, select **Dynamic**.

IP Address: Enter the IP address (Static PPPoE only).

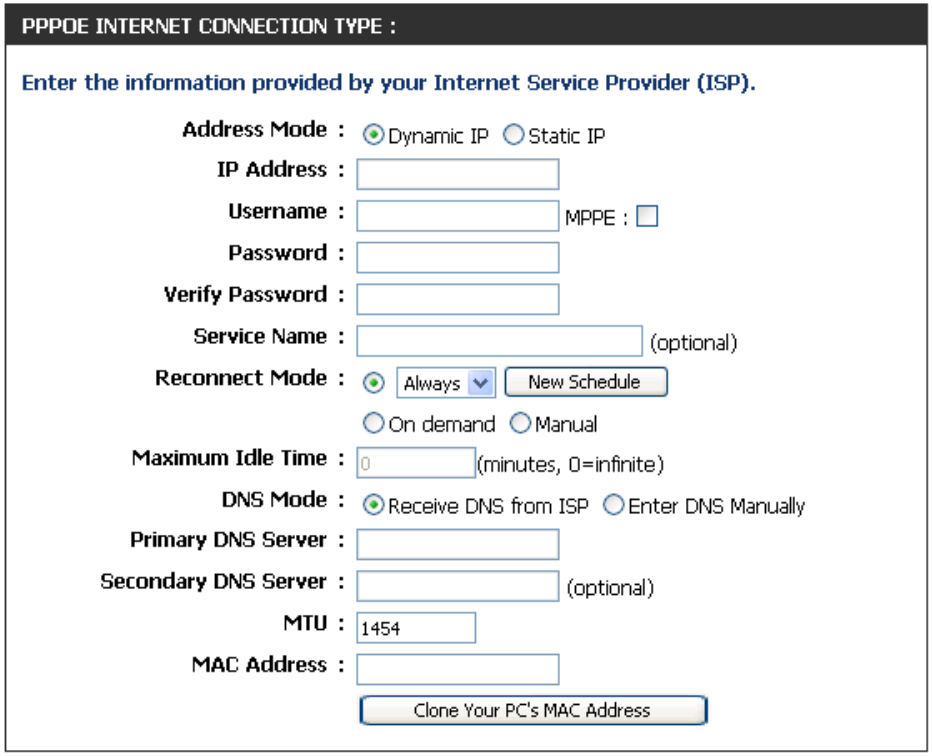
User Name: Enter your PPPoE user name. Check the **MPPE** box to enable the MPPE encryption protocol between the DIR-412 and PPPoE server.

Password: Enter your PPPoE password and then retype the password in the next box.

Service Name: Enter the ISP Service Name (optional).

Reconnect Mode: Select either **Always-on**, **On-Demand**, or **Manual**.

Maximum Idle Time: Enter a maximum idle time during which the Internet connection is maintained during inactivity. To disable this feature, enable Auto-reconnect.


PPPOE INTERNET CONNECTION TYPE :
Enter the information provided by your Internet Service Provider (ISP).
Address Mode : Dynamic IP Static IP
IP Address :
Username : MPPE :
Password :
Verify Password :
Service Name : (optional)
Reconnect Mode : Always New Schedule
On demand Manual
Maximum Idle Time : 0 (minutes, 0=infinite)
DNS Mode : Receive DNS from ISP Enter DNS Manually
Primary DNS Server :
Secondary DNS Server : (optional)
MTU : 1454
MAC Address :
Clone Your PC's MAC Address

DNS Mode:

Click the **Receive DNS from ISP** radio button if you want to dynamically receive the DNS Server IP addresses from your ISP. To manually enter the DNS Server IP addresses, click the **Enter DNS Manually** radio button and enter the DNS Server IP addresses in the **Primary DNS Server** and **Secondary DNS Server** fields.

MAC Address:

The default MAC Address is set to the Internet port's physical interface MAC address on the Broadband Router. It is not recommended that you change the default MAC address unless required by your ISP. You can use the **Clone Your PC's MAC Address** button to replace the Internet port's MAC address with the MAC address of your Ethernet card.

MTU:

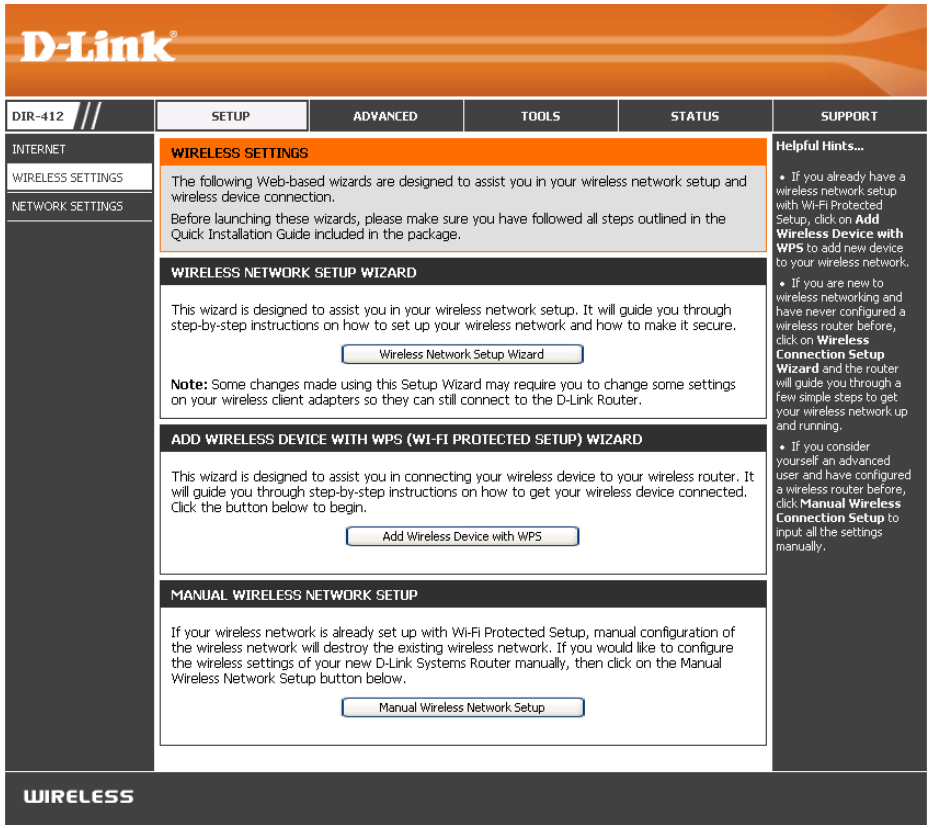
Maximum Transmission Unit - You may need to change the MTU for optimal performance with your specific ISP. 1492 is the default MTU.

Wireless Settings

If you want to configure the wireless settings on your router using the wizard, click **Wireless Network Setup Wizard** and refer to "Wireless Connection Setup Wizard" on page 69.

Click **Add Wireless Device with WPS** if you want to add a wireless device using Wi-Fi Protected Setup (WPS) and refer to "Add Wireless Device with WPS Wizard" on page 72.

If you want to manually configure the wireless settings on your router click **Manual Wireless Network Setup** and refer to the next page.


D-Link
DIR-412
SETUP
ADVANCED
TOOLS
STATUS
SUPPORT
INTERNET
WIRELESS SETTINGS
NETWORK SETTINGS
WIRELESS SETTINGS
The following Web-based wizards are designed to assist you in your wireless network setup and wireless device connection.
Before launching these wizards, please make sure you have followed all steps outlined in the Quick Installation Guide included in the package.
WIRELESS NETWORK SETUP WIZARD
This wizard is designed to assist you in your wireless network setup. It will guide you through step-by-step instructions on how to set up your wireless network and how to make it secure.
Wireless Network Setup Wizard
Note: Some changes made using this Setup Wizard may require you to change some settings on your wireless client adapters so they can still connect to the D-Link Router.
ADD WIRELESS DEVICE WITH WPS (WI-FI PROTECTED SETUP) WIZARD
This wizard is designed to assist you in connecting your wireless device to your wireless router. It will guide you through step-by-step instructions on how to get your wireless device connected. Click the button below to begin.
Add Wireless Device with WPS
MANUAL WIRELESS NETWORK SETUP
If your wireless network is already set up with Wi-Fi Protected Setup, manual configuration of the wireless network will destroy the existing wireless network. If you would like to configure the wireless settings of your new D-Link Systems Router manually, then click on the Manual Wireless Network Setup button below.
Manual Wireless Network Setup
Helpful Hints...
• If you already have a wireless network setup with Wi-Fi Protected Setup, click on Add Wireless Device with WPS to add new device to your wireless network.
• If you are new to wireless networking and have never configured a wireless router before, click on Wireless Connection Setup Wizard and the router will guide you through a few simple steps to get your wireless network up and running.
• If you consider yourself an advanced user and have configured a wireless router before, click Manual Wireless Connection Setup to input all the settings manually.
WIRELESS

Manual Wireless Network Setup

Enable Wireless: Check the box to enable the wireless function. If you do not want to use wireless, uncheck the box to disable all the wireless functions. Click **Add New** to create your own time schedule to enable the wireless function.

Wireless Network Name: Service Set Identifier (SSID) is the name of your wireless network. Create a name using up to 32 characters. The SSID is case-sensitive.

Enable Auto Channel Selection: The **Auto Channel Scan** setting can be selected to allow the DIR-412 to choose the channel with the least amount of interference.

Wireless Channel: Indicates the channel setting for the DIR-412. By default the channel is set to 6. The Channel can be changed to fit the channel setting for an existing wireless network or to customize the wireless network. If you enable **Auto Channel Scan**, this option will be greyed out.

Transmission Rate: Select the transmit rate. It is strongly suggested to select **Best (Auto)** for best performance.

WMM Enable: WMM (Wi-Fi Multimedia) is QoS for your wireless network. Check this box to improve the quality of video and voice applications for your wireless clients. This feature is not available in 802.11n configurations.

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NETWORK SETTINGS
WIRELESS NETWORK
Use this section to configure the wireless settings for your D-Link router. Please note that changes made in this section may also need to be duplicated on your wireless client.
To protect your privacy you can configure wireless security features. This device supports three wireless security modes including: WEP, WPA and WPA2.
Save Settings
Don't Save Settings
WIRELESS NETWORK SETTINGS
Enable Wireless :
Always
New Schedule
Wireless Network Name :
dlink
(Also called the SSID)
Enable Auto Channel Selection :
Wireless Channel :
6
Transmission Rate :
Best (automatic)
(Mbit/s)
WMM Enable :
(Wireless QoS)
Enable Hidden Wireless :
(Also called the SSID Broadcast)
WIRELESS SECURITY MODE
Security Mode :
Disable Wireless Security (not recommended)
Save Settings
Don't Save Settings
Helpful Hints...
• Changing your Wireless Network Name is the first step in securing your wireless network. We recommend that you change it to a familiar name that does not contain any personal information.
• Enable Auto Channel Scat the router can select the best possible channel for your wireless network to operate on.
• Enabling WMM can help control latency and jitter when transmitting multimedia content over a wireless connection.
• Enabling Hidden Mode is another way to secure your network. With this option enabled, no wireless clients will be able to see your wireless network when they perform a scan to see what's available. In order for your wireless devices to connect to your router, you will need to manually enter the Wireless Network Name on each device.
• If you have enabled Wireless Security, make sure you write down the WEP Key or Passphrase that you have configured. You will need to enter this information on any wireless device that you connect to your wireless network.
WIRELESS

Enable Hidden Wireless: Enabling Hidden Mode is another way to secure your network. With this option enabled, no wireless clients will be able to see your wireless network when they perform a scan to see what's available. In order for your wireless devices to connect to your router, you will need to manually enter the Wireless Network Name on each device.

Wireless Security:

Refer to **Section 4 - Wireless security** for more information regarding wireless security.

Network Settings

This section will allow you to change the local network settings of the router and to configure the DHCP settings.

Router IP Address: Enter the IP address of the router. The default IP address is 192.168.0.1.

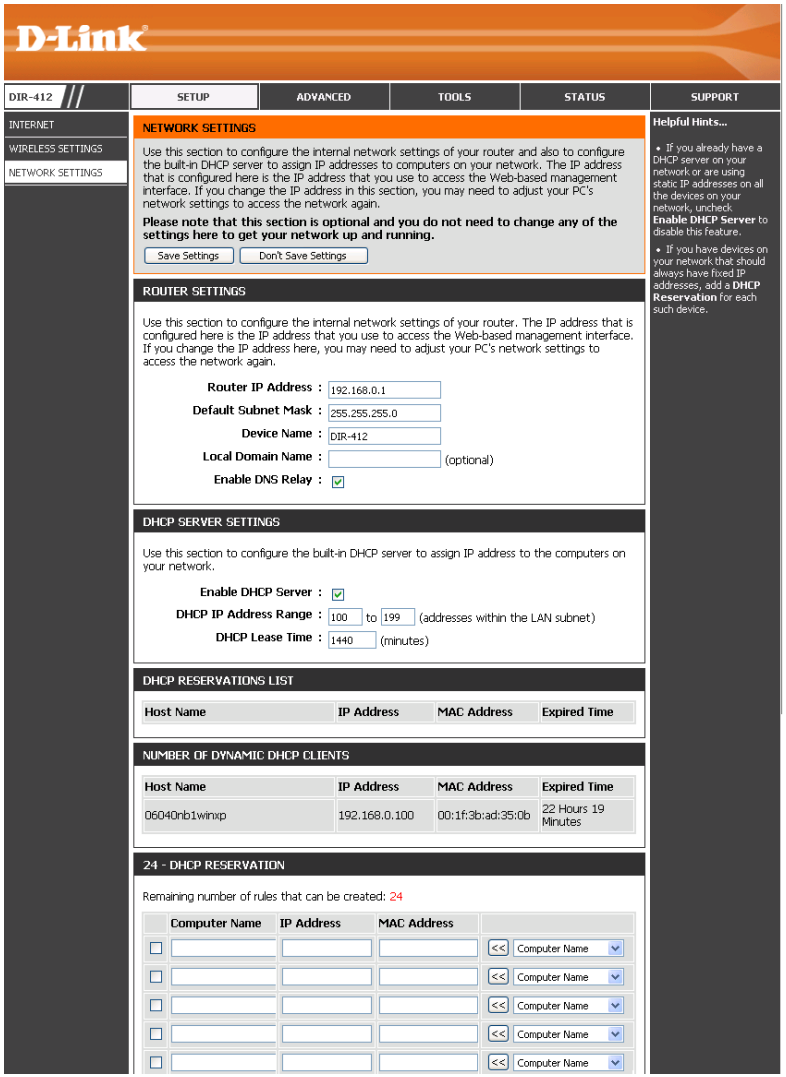
If you change the IP address, once you click **Apply**, you will need to enter the new IP address in your browser to get back into the configuration utility.

Default Subnet Mask: Enter the Subnet Mask. The default subnet mask is 255.255.255.0.

Device Name: Enter the Device name (set to "DIR-412" by default).

Local Domain Name: Enter the Domain name (Optional).

Enable DNS Relay: Uncheck the box to transfer the DNS server information from your ISP to your computers. If checked, your computers will use the router for a DNS server.


D-Link
DIR-412
SETUP
ADVANCED
TOOLS
STATUS
SUPPORT
INTERNET
WIRELESS SETTINGS
NETWORK SETTINGS
NETWORK SETTINGS
Use this section to configure the internal network settings of your router and also to configure the built-in DHCP server to assign IP addresses to computers on your network. The IP address that is configured here is the IP address that you use to access the Web-based management interface. If you change the IP address in this section, you may need to adjust your PC's network settings to access the network again.
Please note that this section is optional and you do not need to change any of the settings here to get your network up and running.
Save Settings
Don't Save Settings
ROUTER SETTINGS
Use this section to configure the internal network settings of your router. The IP address that is configured here is the IP address that you use to access the Web-based management interface. If you change the IP address here, you may need to adjust your PC's network settings to access the network again.
Router IP Address : 192.168.0.1
Default Subnet Mask : 255.255.255.0
Device Name : DIR-412
Local Domain Name : (optional)
Enable DNS Relay :
DHCP SERVER SETTINGS
Use this section to configure the built-in DHCP server to assign IP address to the computers on your network.
Enable DHCP Server :
DHCP IP Address Range : 100 to 199 (addresses within the LAN subnet)
DHCP Lease Time : 1440 (minutes)
DHCP RESERVATIONS LIST
Host Name
IP Address
MAC Address
Expired Time
NUMBER OF DYNAMIC DHCP CLIENTS
Host Name
IP Address
MAC Address
Expired Time
06040nb1winxp
192.168.0.100
00:1f:3b:ad:35:0b
22 Hours 19 Minutes
24 - DHCP RESERVATION
Remaining number of rules that can be created: 24
Computer Name
IP Address
MAC Address
Helpful Hints...
• If you already have a DHCP server on your network or are using static IP addresses on all the devices on your network, uncheck Enable DHCP Server to disable this feature.
• If you have devices on your network that should always have fixed IP addresses, add a DHCP Reservation for each such device.

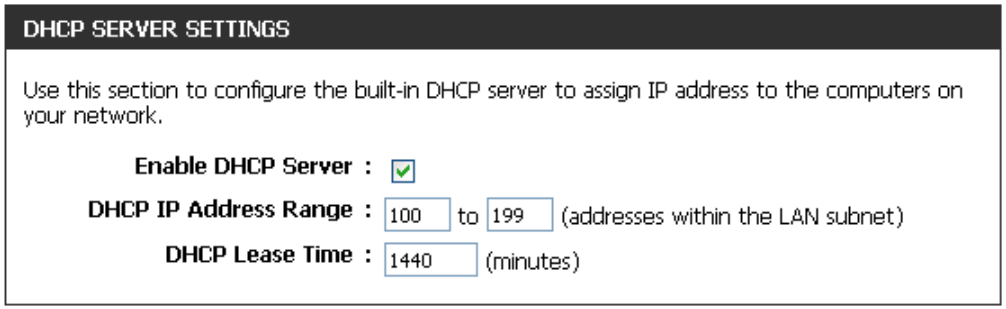
DHCP Server Settings

DHCP stands for Dynamic Host Control Protocol. The DIR-412 has a built-in DHCP server. The DHCP Server will automatically assign an IP address to the computers on the LAN/private network. Be sure to set your computers to be DHCP clients by setting their TCP/IP settings to **Obtain an IP Address Automatically**. When you turn your computers on, they will automatically load the proper TCP/IP settings provided by the DIR-412. The DHCP Server will automatically allocate an unused IP address from the IP address pool to the requesting computer. You must specify the starting and ending address of the IP address pool.

Enable DHCP Server: Check this box to enable the DHCP server on your router. Uncheck to disable this function.

DHCP IP Address Range: Enter the starting and ending IP addresses for the DHCP server's IP assignment.

Note: If you statically (manually) assign IP addresses to your computers or devices, make sure the IP addresses are outside of this range or you may have an IP conflict.


DHCP SERVER SETTINGS
Use this section to configure the built-in DHCP server to assign IP address to the computers on your network.
Enable DHCP Server :
DHCP IP Address Range :
100
to
199
(addresses within the LAN subnet)
DHCP Lease Time :
1440
(minutes)

DHCP Lease Time: The length of time for the IP address lease. Enter the Lease time in minutes.

DHCP Reservation

If you want a computer or device to always have the same IP address assigned, you can create a DHCP reservation. The router will assign the IP address only to that computer or device.

Note: This IP address must be within the DHCP IP Address Range.

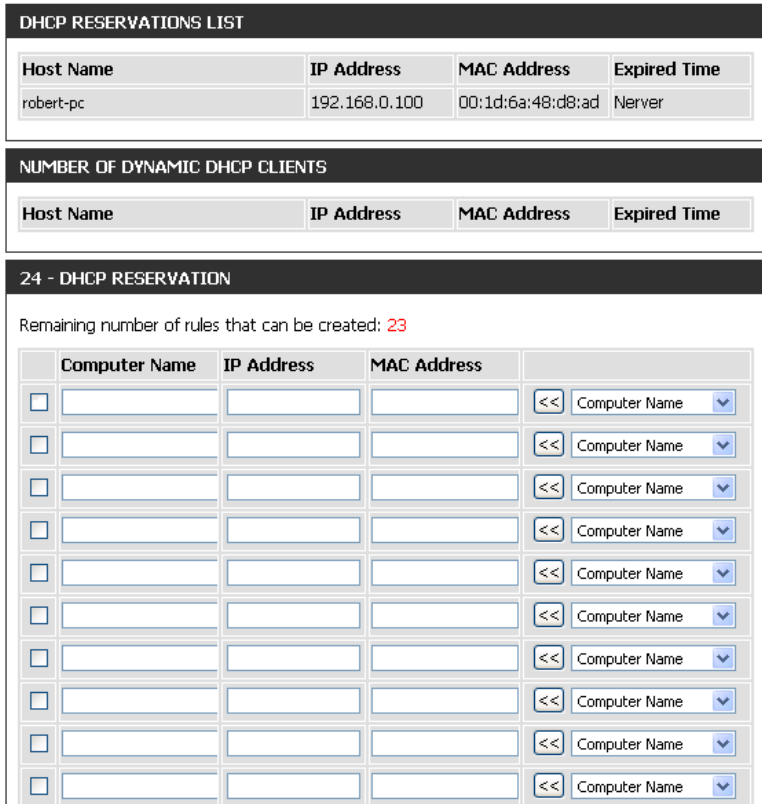
DHCP Reservations List: Displays a list of the DHCP reservations that have been configured on the router.

Number of Dynamic DHCP Clients: In this section, you can see information about the LAN devices that are currently being leased IP addresses.

Computer Name: Enter the computer name or select a computer name from the drop-down menu on the right-hand side and click <<.

IP Address: Enter the IP address you want to assign to the computer or device. This IP Address must be within the DHCP IP Address Range.

MAC Address: Enter the MAC address of the computer or device.



When you have finished configuring the above settings, check the boxes next to the DHCP Reservation entries you want to add to the DHCP Reservations List and click the **Save Settings** button at the top or bottom of the window to save your entries and activate your reservations.

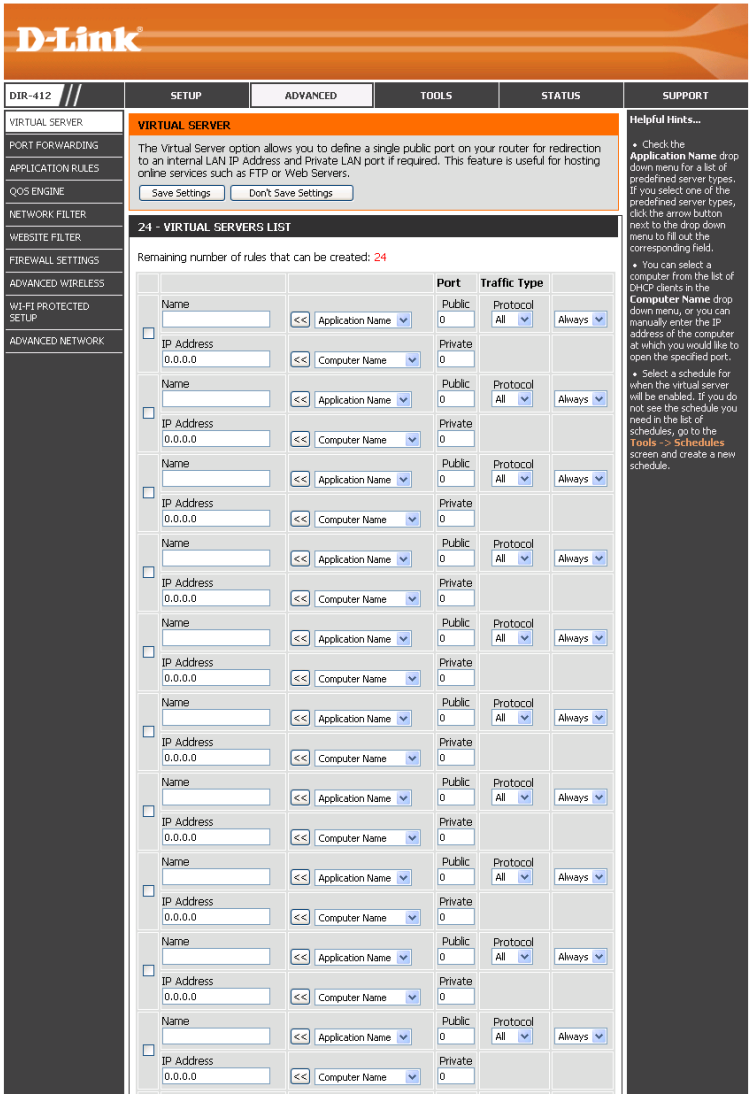
Virtual Server

The DIR-412 can be configured as a virtual server so that remote users accessing Web or FTP services via the public IP address can be automatically redirected to local servers in the LAN (Local Area Network).

The DIR-412 firewall feature filters out unrecognized packets to protect your LAN network so all computers networked with the DIR-412 are invisible to the outside world. If you wish, you can make some of the LAN computers accessible from the Internet by enabling Virtual Server. Depending on the requested service, the DIR-412 redirects the external service request to the appropriate server within the LAN network.

The DIR-412 is also capable of port-redirection meaning incoming traffic to a particular port may be redirected to a different port on the server computer.

Each virtual service that is created will be listed at the bottom of the screen in the Virtual Servers List. Pre-defined virtual services are already listed in the table. You may use them by enabling them and assigning the server IP to use that particular virtual service.


D-Link
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SETUP
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TOOLS
STATUS
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VIRTUAL SERVER
PORT FORWARDING
APPLICATION RULES
QOS ENGINE
NETWORK FILTER
WEBSITE FILTER
FIREWALL SETTINGS
ADVANCED WIRELESS
WI-FI PROTECTED SETUP
ADVANCED NETWORK
VIRTUAL SERVER
The Virtual Server option allows you to define a single public port on your router for redirection to an internal LAN IP Address and Private LAN port if required. This feature is useful for hosting online services such as FTP or Web Servers.
Save Settings
Don't Save Settings
24 - VIRTUAL SERVERS LIST
Remaining number of rules that can be created: 24
Port
Traffic Type
Name
Application Name
Public
Protocol
Always
IP Address
Computer Name
Private
Helpful Hints...
Check the Application Name drop down menu for a list of predefined server types. If you select one of the predefined server types, click the arrow button next to the drop down menu to fill out the corresponding field.
You can select a computer from the list of DHCP clients in the Computer Name drop down menu, or you can manually enter the IP address of the computer at which you would like to open the specified port.
Select a schedule for when the virtual server will be enabled. If you do not see the schedule you need in the list of schedules, go to the Tools -> Schedules screen and create a new schedule.

The Virtual Server feature allows you to open a single port. If you would like to open a range of ports, refer to the next page. Configure the parameters, as described below, to create a new Virtual Server entry.

Name: Enter a name for the rule or select an application from the drop-down menu. Select an application and click << to populate the fields.

IP Address: Enter the IP address of the computer on your local network that you want to allow the incoming service to. If your computer is receiving an IP address automatically from the router (DHCP), you computer will be listed in the "Computer Name" drop-down menu. Select your computer and click <<.

Public Port/ Private Port: Enter the port number that you want to open next to Private Port and Public Port. The private and public ports are usually the same. The private port is the port being used by the application on the computer within your local network, and the public port is the port seen from the Internet side.

Protocol Type: Select **TCP**, **UDP**, or **Both** from the drop-down menu.

Schedule: The schedule of time when the Virtual Server Rule will be enabled. The schedule may be set to Always, which will allow the particular service to always be enabled. You can create your own times in the **Tools** > **Schedules** section.

Port Forwarding

Port Forwarding is a feature that allows you to open a single port or a range of ports and redirect the data received through those ports to a single PC on your network.

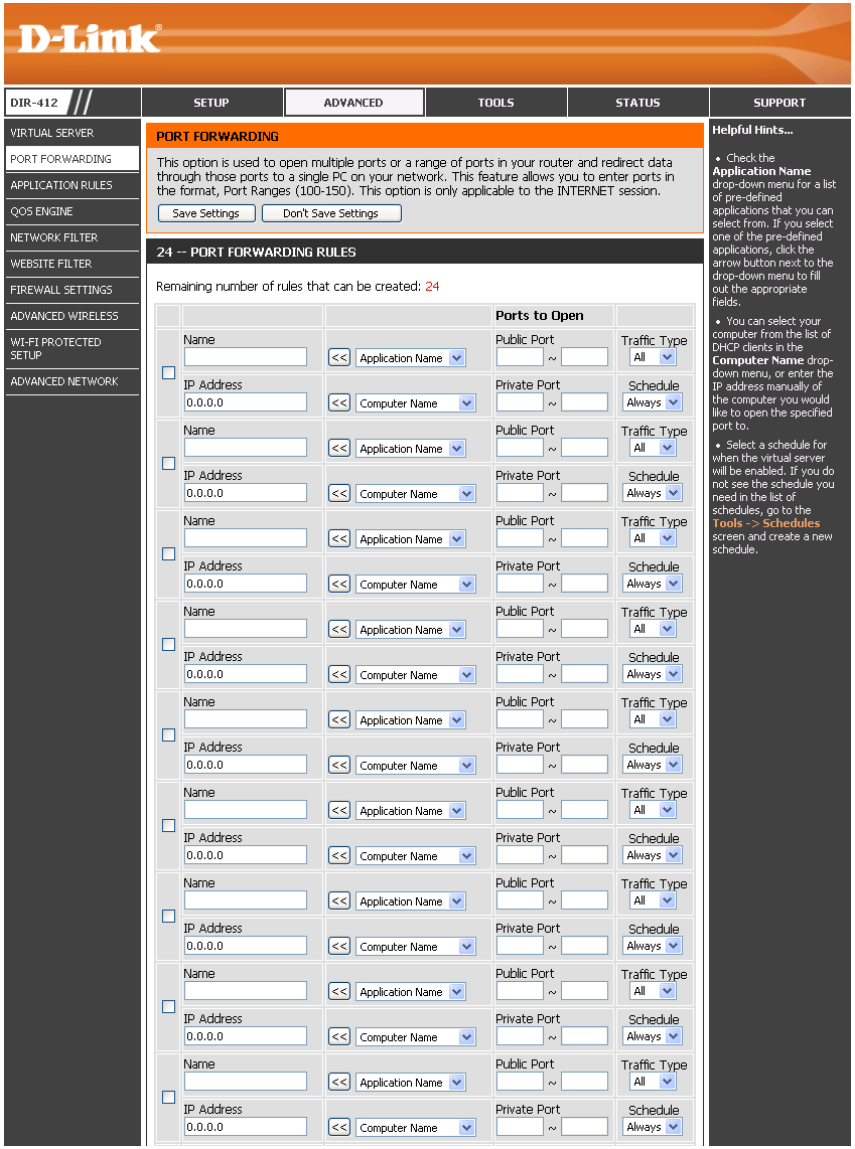
Name: Enter a name for the rule or select an application from the drop-down menu. Select an application and click << to populate the fields.

IP Address: Enter the IP address of the computer on your local network that you want to allow the incoming service to. If your computer is receiving an IP address automatically from the router (DHCP), you computer will be listed in the "Computer Name" drop-down menu. Select your computer and click <<.

Public Port/ Private Port: Enter the range of ports that you want to open next to the Private Port and Public Port fields. The private and public ports are usually the same. The private ports are the ports being used by the application on the computer within your local network, and the public ports are the ports seen from the Internet side.

Traffic Type: Use the drop-down menu to select whether **TCP**, **UDP**, or **All** types of traffic are being used for the port forwarding rule.

Schedule: Select a schedule for when the Port Forwarding Rule will be enabled. The schedule may be set to Always, which will allow the particular service to always be enabled. You can create your own times in the **Tools** > **Schedules** section.


D-Link
DIR-412
SETUP
ADVANCED
TOOLS
STATUS
SUPPORT
VIRTUAL SERVER
PORT FORWARDING
APPLICATION RULES
QOS ENGINE
NETWORK FILTER
WEBSITE FILTER
FIREWALL SETTINGS
ADVANCED WIRELESS
WI-FI PROTECTED SETUP
ADVANCED NETWORK
PORT FORWARDING
This option is used to open multiple ports or a range of ports in your router and redirect data through those ports to a single PC on your network. This feature allows you to enter ports in the format, Port Ranges (100-150). This option is only applicable to the INTERNET session.
Save Settings
Don't Save Settings
24 -- PORT FORWARDING RULES
Remaining number of rules that can be created: 24
Ports to Open
Name
IP Address
Public Port
Private Port
Traffic Type
Schedule
Application Name
Computer Name
Always
Helpful Hints...
Check the Application Name drop-down menu for a list of pre-defined applications that you can select from. If you select one of the pre-defined applications, click the arrow button next to the drop-down menu to fill out the appropriate fields.
You can select your computer from the list of DHCP clients in the Computer Name drop-down menu, or enter the IP address manually of the computer you would like to open the specified port to.
Select a schedule for when the virtual server will be enabled. If you do not see the schedule you need in the list of schedules, go to the Tools -> Schedules screen and create a new schedule.

Application Rules

Some applications require multiple connections, such as Internet gaming, video conferencing, Internet telephony and others. These applications have difficulties working through NAT (Network Address Translation). Special Applications makes some of these applications work with the DIR-412. If you need to run applications that require multiple connections, specify the port normally associated with an application in the "Trigger Port" field, select the protocol type as TCP or UDP, then enter the firewall (public) ports associated with the trigger port to open them for inbound traffic.

The DIR-412 provides some predefined applications in the table on the bottom of the web page. Select the application you want to use and enable it.

Name: Enter a name for the rule. You may select a pre-defined application from the drop-down menu and click <<.

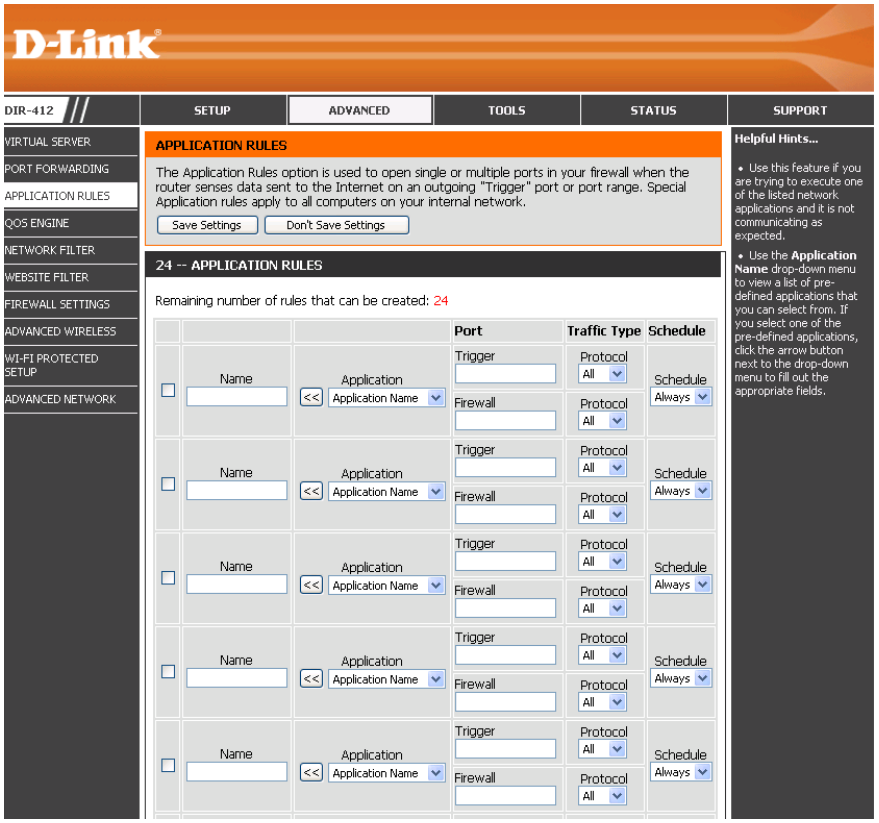
Trigger: This is the port used to trigger the application. It can be either a single port or a range of ports.

Traffic Type: Select the protocol of the trigger port (TCP, UDP, or All).

Firewall: This is the port number on the Internet side that will be used to access the application. You may define a single port or a range of ports. You can use a comma to add multiple ports or port ranges.

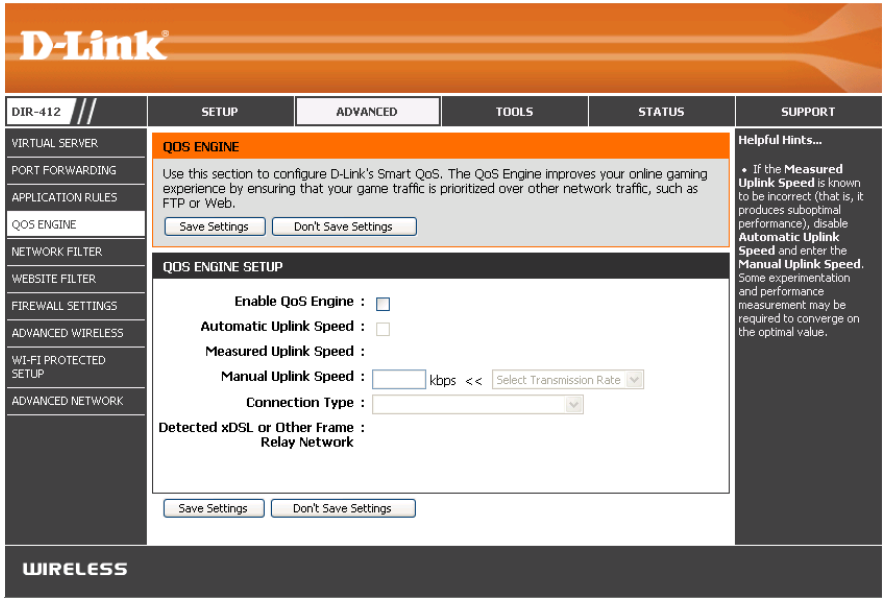
Traffic Type: Select the protocol of the firewall port (TCP, UDP, or All).

Schedule: Select a schedule for when the Application Rule will be enabled. If you do not see the schedule you need in the list of schedules, go to the Tools > Schedules screen and create a new schedule.


D-Link
DIR-412
SETUP
ADVANCED
TOOLS
STATUS
SUPPORT
VIRTUAL SERVER
PORT FORWARDING
APPLICATION RULES
QOS ENGINE
NETWORK FILTER
WEBSITE FILTER
FIREWALL SETTINGS
ADVANCED WIRELESS
WI-FI PROTECTED SETUP
ADVANCED NETWORK
APPLICATION RULES
The Application Rules option is used to open single or multiple ports in your firewall when the router senses data sent to the Internet on an outgoing "Trigger" port or port range. Special Application rules apply to all computers on your internal network.
Save Settings
Don't Save Settings
24 -- APPLICATION RULES
Remaining number of rules that can be created: 24
Port
Traffic Type
Schedule
Name
Application
Application Name
Trigger
Firewall
Protocol
All
Always
Helpful Hints...
• Use this feature if you are trying to execute one of the listed network applications and it is not communicating as expected.
• Use the Application Name drop-down menu to view a list of pre-defined applications that you can select from. If you select one of the pre-defined applications, click the arrow button next to the drop-down menu to fill out the appropriate fields.

QoS Engine

The QoS Engine option helps improve your network gaming performance by prioritizing applications. By default the QoS Engine settings are disabled and application priority is not classified automatically.


D-Link
DIR-412
SETUP
ADVANCED
TOOLS
STATUS
SUPPORT
VIRTUAL SERVER
PORT FORWARDING
APPLICATION RULES
QOS ENGINE
NETWORK FILTER
WEBSITE FILTER
FIREWALL SETTINGS
ADVANCED WIRELESS
WI-FI PROTECTED SETUP
ADVANCED NETWORK
QOS ENGINE
Use this section to configure D-Link's Smart QoS. The QoS Engine improves your online gaming experience by ensuring that your game traffic is prioritized over other network traffic, such as FTP or Web.
Save Settings
Don't Save Settings
QOS ENGINE SETUP
Enable QoS Engine :
Automatic Uplink Speed :
Measured Uplink Speed :
Manual Uplink Speed :
kbps <<
Select Transmission Rate
Connection Type :
Detected xDSL or Other Frame Relay Network :
Save Settings
Don't Save Settings
Helpful Hints...
• If the Measured Uplink Speed is known to be incorrect (that is, it produces suboptimal performance), disable Automatic Uplink Speed and enter the Manual Uplink Speed. Some experimentation and performance measurement may be required to converge on the optimal value.
WIRELESS

Enable QoS Engine: This option is disabled by default. Enable this option for better performance and experience with online games and other interactive applications, such as VoIP.

Automatic Uplink Speed: This option will allow your router to automatically determine the uplink speed of your Internet connection.

Measured Uplink Speed: This displays the detected uplink speed.

Manual Uplink Speed: The speed at which data can be transferred from the router to your ISP. This is determined by your ISP. ISP's offer speed as a download/upload pair. For example, 1.5Mbits/284Kbits. Using this example, you would enter 284. Alternatively you can test your uplink speed with a service such as www.dslreports.com.

Connection Type: This option allows you to select your connection type. Users can select "auto-detect" or choose the xDSL or cable networks if they know.

Detected xDSL or Other Frame Relay Network: This displays if xDSL or another type of frame relay network has been detected. The DIR-412 can detect the network and the user can confirm this.

Network Filters

Use MAC (Media Access Control) Filters to allow or deny LAN (Local Area Network) computers by their MAC addresses from accessing the Network. You can either manually add a MAC address or select the MAC address from the list of clients that are currently connected to the Broadband Router.

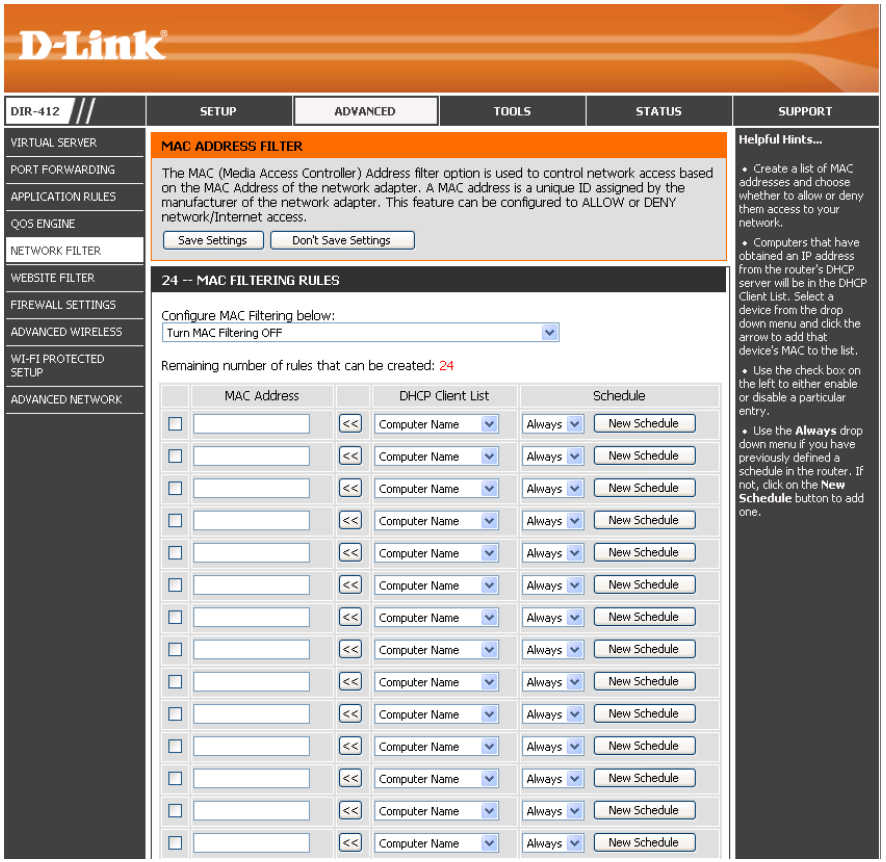
Configure MAC Filtering: Select **Turn MAC Filtering Off**, **Allow MAC addresses listed below**, or **Deny MAC addresses listed below** from the drop-down menu.

MAC Address: Enter the MAC address you would like to filter.

To find the MAC address on a computer, please refer to the Networking Basics section in this manual.

DHCP Client: Select a DHCP client from the drop-down menu and click << to copy the MAC Address from the DHCP client.

Schedule: Select a schedule for when the Network Filter will be enabled. The user can click the **New Schedule** button to bring up the "Schedule Webpage" to configure a new schedule.


D-Link
DIR-412
SETUP
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VIRTUAL SERVER
PORT FORWARDING
APPLICATION RULES
QOS ENGINE
NETWORK FILTER
WEBSITE FILTER
FIREWALL SETTINGS
ADVANCED WIRELESS
WI-FI PROTECTED SETUP
ADVANCED NETWORK
MAC ADDRESS FILTER
The MAC (Media Access Controller) Address filter option is used to control network access based on the MAC Address of the network adapter. A MAC address is a unique ID assigned by the manufacturer of the network adapter. This feature can be configured to ALLOW or DENY network/Internet access.
Save Settings
Don't Save Settings
24 -- MAC FILTERING RULES
Configure MAC Filtering below:
Turn MAC Filtering OFF
Remaining number of rules that can be created: 24
MAC Address
DHCP Client List
Schedule
Computer Name
Always
New Schedule
Helpful Hints...
• Create a list of MAC addresses and choose whether to allow or deny them access to your network.
• Computers that have obtained an IP address from the router's DHCP server will be in the DHCP Client List. Select a device from the drop down menu and click the arrow to add that device's MAC to the list.
• Use the check box on the left to either enable or disable a particular entry.
• Use the Always drop down menu if you have previously defined a schedule in the router. If not, click on the New Schedule button to add one.

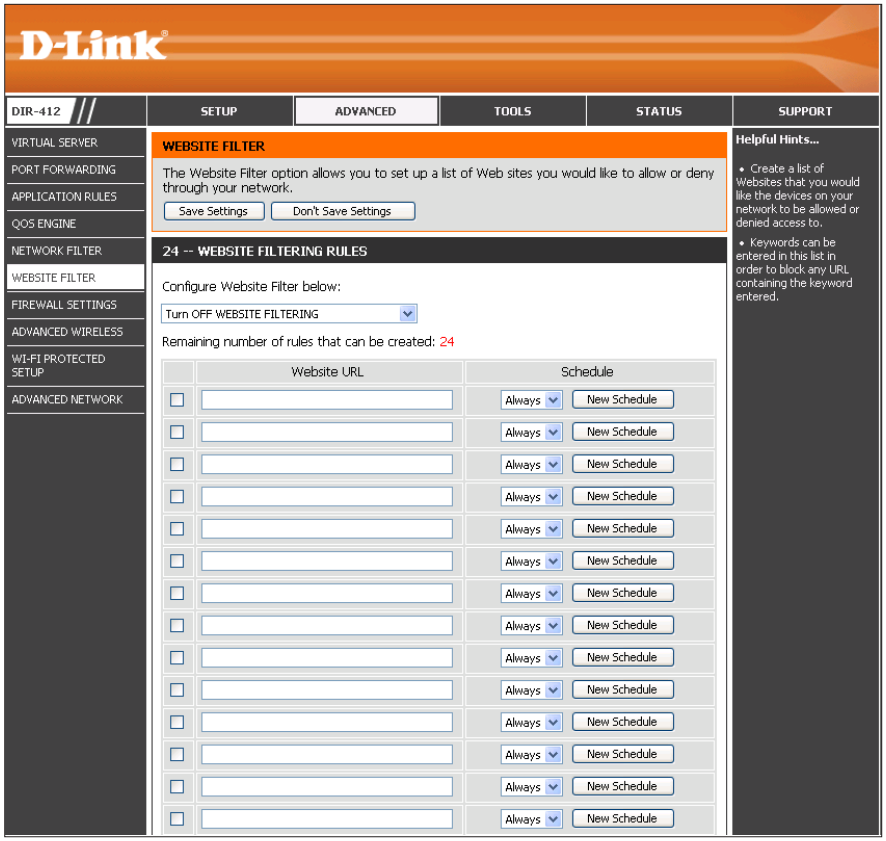
Website Filters

Website Filters are used to allow you to set up a list of allowed Web sites that can be used by multiple users through the network. To use this feature select to **Allow** or **Deny**, enter the domain or website and click **Add**, and then click **Save Settings**. You must also select **Apply Web Filter** under the Access Control section.

Configure Website Filter Below: Select **Deny** or **Allow** computers access to only these sites.

Website URL: Enter the URLs that you want to allow or deny.

Schedule: Use the drop-down menu to select the schedule for the Network Filter rule. Click the **New Schedule** button to bring up the "Schedule Webpage" to configure the new schedule.


D-Link
DIR-412
SETUP
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TOOLS
STATUS
SUPPORT
VIRTUAL SERVER
PORT FORWARDING
APPLICATION RULES
QOS ENGINE
NETWORK FILTER
WEBSITE FILTER
FIREWALL SETTINGS
ADVANCED WIRELESS
WI-FI PROTECTED SETUP
ADVANCED NETWORK
WEBSITE FILTER
The Website Filter option allows you to set up a list of Web sites you would like to allow or deny through your network.
Save Settings
Don't Save Settings
24 -- WEBSITE FILTERING RULES
Configure Website Filter below:
Turn OFF WEBSITE FILTERING
Remaining number of rules that can be created: 24
Website URL
Schedule
Always
New Schedule
Helpful Hints...
• Create a list of Websites that you would like the devices on your network to be allowed or denied access to.
• Keywords can be entered in this list in order to block any URL containing the keyword entered.

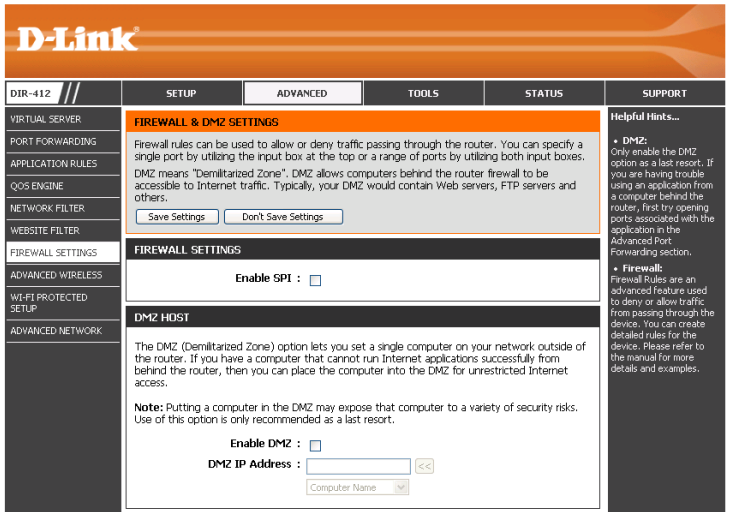
Firewall Settings

A firewall protects your network from the outside world. The D-Link DIR-412 offers a firewall type functionality. The SPI feature helps prevent cyber attacks. Sometimes you may want a computer exposed to the outside world for certain types of applications. If you choose to expose a computer, you can enable DMZ. DMZ is short for Demilitarized Zone. This option will expose the chosen computer completely to the outside world.

Enable SPI: SPI (Stateful Packet Inspection, also known as dynamic packet filtering) helps to prevent cyber attacks by tracking more state per session. It validates that the traffic passing through the session conforms to the protocol.

DMZ Host: Check the **Enable DMZ** box and specify the IP address of the computer on the LAN that you want to have unrestricted Internet communication in the **DMZ IP Address** field. Use the drop-down menu to specify a host that currently has a DHCP lease from the DIR-412. If this computer has obtained its IP address automatically using DHCP, be sure to make a static reservation on the **System > Network Settings** page so that the IP address of the DMZ machine does not change.

Firewall Rules: Use this section to create rules that deny or allow traffic from passing through the device. See the following page for information on how to create firewall rules.


D-Link
DIR-412
SETUP
ADVANCED
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STATUS
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VIRTUAL SERVER
PORT FORWARDING
APPLICATION RULES
QOS ENGINE
NETWORK FILTER
WEBSITE FILTER
FIREWALL SETTINGS
ADVANCED WIRELESS
WI-FI PROTECTED SETUP
ADVANCED NETWORK
FIREWALL & DMZ SETTINGS
Firewall rules can be used to allow or deny traffic passing through the router. You can specify a single port by utilizing the input box at the top or a range of ports by utilizing both input boxes.
DMZ means "Demilitarized Zone". DMZ allows computers behind the router firewall to be accessible to Internet traffic. Typically, your DMZ would contain Web servers, FTP servers and others.
Save Settings
Don't Save Settings
FIREWALL SETTINGS
Enable SPI :
DMZ HOST
The DMZ (Demilitarized Zone) option lets you set a single computer on your network outside of the router. If you have a computer that cannot run Internet applications successfully from behind the router, then you can place the computer into the DMZ for unrestricted Internet access.
Note: Putting a computer in the DMZ may expose that computer to a variety of security risks. Use of this option is only recommended as a last resort.
Enable DMZ :
DMZ IP Address :
Computer Name
Helpful Hints...
• DMZ:
Only enable the DMZ option as a last resort. If you are having trouble using an application from a computer behind the router, first try opening ports associated with the application in the Advanced Port Forwarding section.
• Firewall:
Firewall Rules are an advanced feature used to deny or allow traffic from passing through the device. You can create detailed rules for the device. Please refer to the manual for more details and examples.

Firewall Rules

To create a firewall rule, configure the parameters as described below:

Name: Enter a name for the firewall rule.

Action: Use the drop-down menu to specify if the router should **Allow** or **Deny** traffic matching the firewall rule.

Interface: Use the drop-down menus to select the **Source** and **Destination** interfaces for the Firewall Rule

Use the **IP Address** fields next to each **Interface** drop-down menu to specify the IP address ranges for the Source/Destination interfaces.

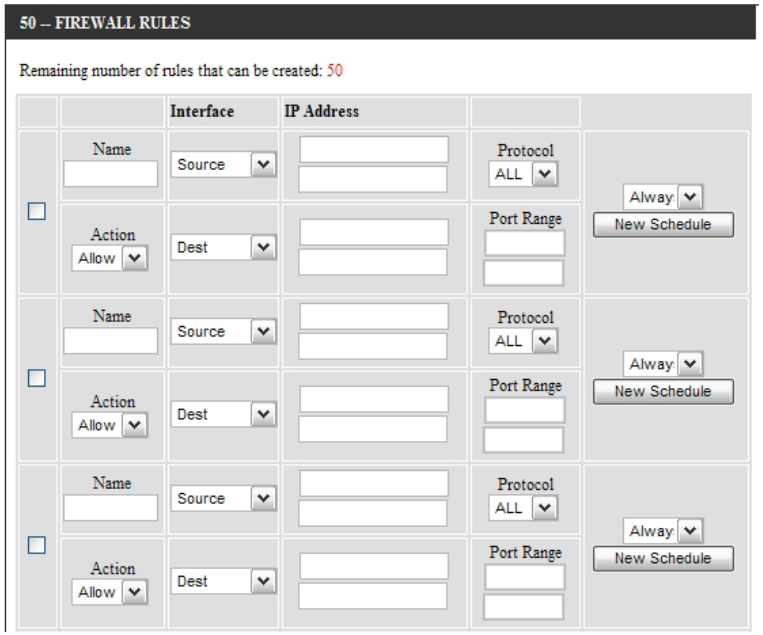
The first host in the IP address range should be entered in the top field and the last host in the IP address range should be entered in the field beneath for both the Source/Destination intefaces.

Protocol: Use the drop-down menu to select the protocol that will be used for the firewall rule (TCP, UDP, ICMP, or ALL).

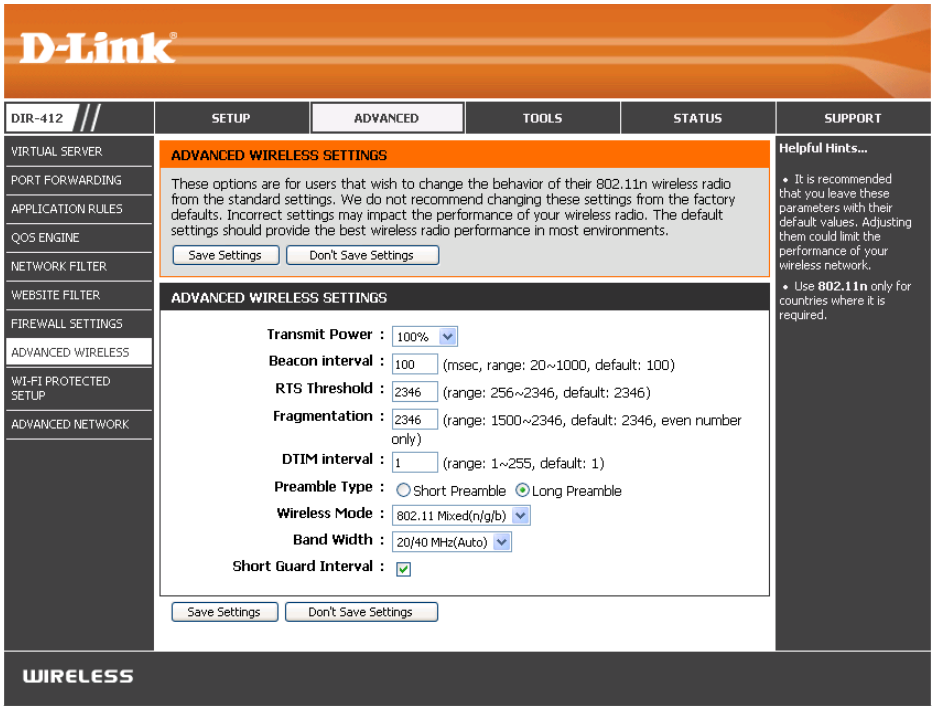
Port Range: Enter the range of ports that the firewall rule will apply to.

The first port in the port range should be entered in the top field and the last host in the port range should be entered in the field beneath.

Schedule: Use the drop-down menu to select the schedule for the Network Filter rule. Click the **New Schedule** button to bring up the "Schedule Webpage" to configure the new schedule.



Advanced Wireless Settings


D-Link
DIR-412
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NETWORK FILTER
WEBSITE FILTER
FIREWALL SETTINGS
ADVANCED WIRELESS
WI-FI PROTECTED SETUP
ADVANCED NETWORK
ADVANCED WIRELESS SETTINGS
These options are for users that wish to change the behavior of their 802.11n wireless radio from the standard settings. We do not recommend changing these settings from the factory defaults. Incorrect settings may impact the performance of your wireless radio. The default settings should provide the best wireless radio performance in most environments.
Save Settings
Don't Save Settings
ADVANCED WIRELESS SETTINGS
Transmit Power : 100%
Beacon interval : 100 (msec, range: 20~1000, default: 100)
RTS Threshold : 2346 (range: 256~2346, default: 2346)
Fragmentation : 2346 (range: 1500~2346, default: 2346, even number only)
DTIM interval : 1 (range: 1~255, default: 1)
Preamble Type : Short Preamble Long Preamble
Wireless Mode : 802.11 Mixed(n/g/b)
Band Width : 20/40 MHz(Auto)
Short Guard Interval :
Save Settings
Don't Save Settings
Helpful Hints...
• It is recommended that you leave these parameters with their default values. Adjusting them could limit the performance of your wireless network.
• Use 802.11n only for countries where it is required.
WIRELESS

Transmit Power: Set the transmit power of the antennas.

Beacon Period: Beacons are packets sent by an Access Point to synchronize a wireless network. Specify a value. 100 is the default setting and is recommended.

RTS Threshold: This value should remain at its default setting of 2432. If inconsistent data flow is a problem, only a minor modification should be made.

Fragmentation: The fragmentation threshold, which is specified in bytes, determines whether packets will be fragmented. Packets exceeding the 2346 byte setting will be fragmented before transmission. 2346 is the default setting.

DTIM Interval: (Delivery Traffic Indication Message) 1 is the default setting. A DTIM is a countdown informing clients of the next window for listening to broadcast and multicast messages.

Preamble Type: Select **Short** or **Long Preamble**. The preamble defines the length of the CRC block (Cyclic Redundancy Check is a common technique for detecting data transmission errors) for communication between the wireless router and the roaming wireless network adapters. Note: High network traffic areas should use the **Short Preamble** type.

Wireless Mode: Use the drop-down menu to select the wireless modes you want to enable on the router. The available options are **802.11n only**, **802.11 Mixed(g/b)**, and **802.11 Mixed(n/g/b)**.

Band Width: This setting can be used to adjust the bandwidth of the wireless signal. The default setting is **20/40 MHz (Auto)**.

Short Guard Interval: Check this box to reduce the guard interval time therefore increasing the data capacity. However, it's less reliable and may create higher data loss.

Wi-Fi Protected Setup

Wi-Fi Protected Setup: Check this box to enable the function.

PIN Settings: Use the buttons to generate a new PIN or Reset the PIN to Default settings.

Add Wireless Station: Click the button to start the wizard that sets up the WPA function. Please refer to Section 4 - Wireless security "Add wireless device with WPA wizard" for more information.

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QOS ENGINE
NETWORK FILTER
WEBSITE FILTER
FIREWALL SETTINGS
ADVANCED WIRELESS
WI-FI PROTECTED SETUP
ADVANCED NETWORK
WI-FI PROTECTED SETUP
Wi-Fi Protected Setup is used to easily add devices to a network using a PIN or button press. Devices must support Wi-Fi Protected Setup in order to be configured by this method.
If the PIN changes, the new PIN will be used in following Wi-Fi Protected Setup process. Clicking on "Don't Save Settings" button will not reset the PIN.
However, if the new PIN is not saved, it will get lost when the device reboots or loses power.
Save Settings
Don't Save Settings
WI-FI PROTECTED SETUP
Enable :
Reset to Unconfigured
PIN SETTINGS
PIN : 00070225
Reset PIN to Default
Generate New PIN
ADD WIRELESS STATION
Connect your Wireless Device
Save Settings
Don't Save Settings
Helpful Hints...
• Enable if other wireless devices you wish to include in the local network support Wi-Fi Protected Setup.
• Only "Admin" account can change security settings.
• Click Connect your Wireless Device to use Wi-Fi Protected Setup to add wireless devices to the wireless network.
WIRELESS

Advanced Network Settings

UPnP: To use the Universal Plug and Play (UPnP™) feature check the **Enable UPNP** box. UPNP provides compatibility with networking equipment, software and peripherals.

WAN Ping: Unchecking the box will not allow the DIR-412 to respond to pings. Blocking the Ping may provide some extra security from hackers. Check the box to allow the Internet port to be "pinged".

WAN Port Speed: You may set the port speed of the Internet port to 10Mbps, 100Mbps, or auto. Some older cable or DSL modems may require you to set the port speed to 10Mbps.

Multicast Streams: Check the **Enable Multicast Streams** box to allow multicast traffic to pass through the router from the Internet.

Wireless Enhance Mode: Check the **Wireless Enhance Mode** box to enable the router to forward all multicast streams from the Internet to the wireless station using a unicast stream. This feature helps improve the quality of multimedia applications for wireless users.

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FIREWALL SETTINGS
ADVANCED WIRELESS
WI-FI PROTECTED SETUP
ADVANCED NETWORK
ADVANCED NETWORK SETTINGS
These options are for users that wish to change the LAN settings. We do not recommend changing these settings from factory default. Changing these settings may affect the behavior of your network.
Save Settings
Don't Save Settings
UPNP
Universal Plug and Play(UPnP) supports peer-to-peer Plug and Play functionality for network devices.
Enable UPnP :
WAN PING
If you enable this feature, the WAN port of your router will respond to ping requests from the Internet that are sent to the WAN IP Address.
Enable WAN Ping Response :
MULTICAST STREAMS
Enable Multicast Streams :
Wireless Enhance Mode :
Save Settings
Don't Save Settings
Helpful Hints...
• For added security, it is recommended that you disable the WAN Ping Respond option. Ping is often used by malicious Internet users to locate active networks or PCs.
• The WAN speed is usually detected automatically. If you are having problems connecting to the WAN, try selecting the speed manually.
• If you are having trouble receiving video on demand type of service from the Internet, make sure the Multicast Stream option is enabled.
WIRELESS

Administrator Settings

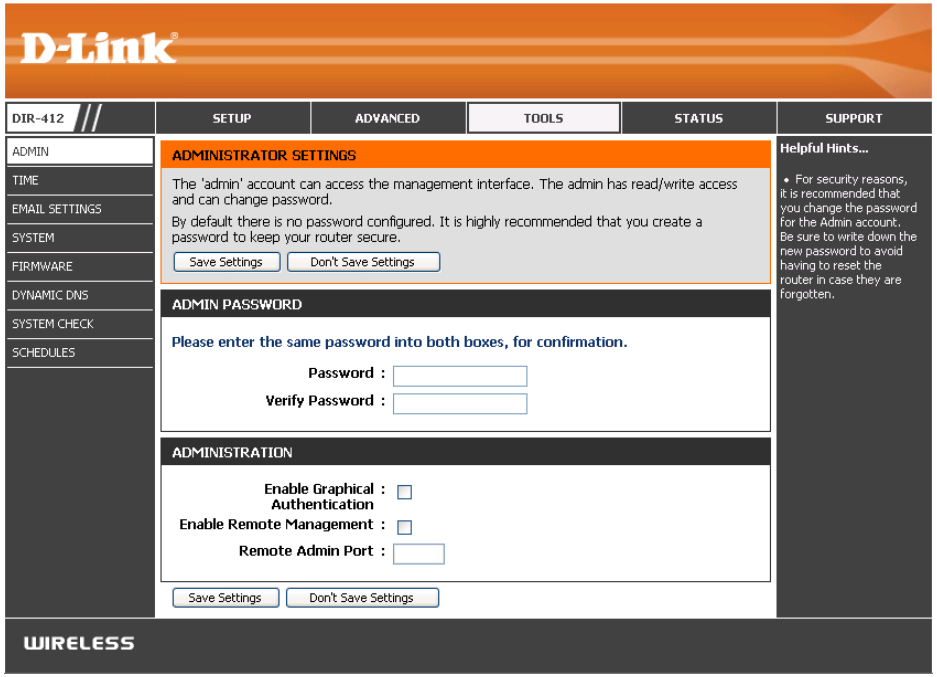
This page will allow you to change the Administrator and User passwords. You can also enable Remote Management. There are two accounts that can access the management interface through the web browser. The accounts are admin and user. Admin has read/write access while user has read-only access. User can only view the settings but cannot make any changes. Only the admin account has the ability to change both admin and user account passwords.

Admin Password: Enter and confirm a new password for the Administrator Login Name. The administrator can make changes to the settings.

Enable Graphical Authentication: Check this box to enable graphical authentication. The device supports this function to prevent phishing.

Enable Remote Management: Remote management allows the DIR-412 to be configured from the Internet by a web browser. A username and password is still required to access the Web-Management interface. In general, only a member of your network can browse the built-in web pages to perform Administrator tasks. This feature enables you to perform Administrator tasks from the remote (Internet) host.

Remote Admin Port: The port number used to access the DIR-412. Example: http://x.x.x.x:8080 whereas x.x.x.x is the Internet IP address of the DIR-412 and 8080 is the port used for the Web Management interface.


D-Link
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DYNAMIC DNS
SYSTEM CHECK
SCHEDULES
ADMINISTRATOR SETTINGS
The 'admin' account can access the management interface. The admin has read/write access and can change password.
By default there is no password configured. It is highly recommended that you create a password to keep your router secure.
Save Settings
Don't Save Settings
ADMIN PASSWORD
Please enter the same password into both boxes, for confirmation.
Password :
Verify Password :
ADMINISTRATION
Enable Graphical Authentication :
Enable Remote Management :
Remote Admin Port :
Save Settings
Don't Save Settings
Helpful Hints...
• For security reasons, it is recommended that you change the password for the Admin account. Be sure to write down the new password to avoid having to reset the router in case they are forgotten.
WIRELESS

Time Settings

The Time Configuration option allows you to configure, update, and maintain the correct time on the internal system clock. From this section you can set the time zone that you are in and set the Time Server. Daylight Saving can also be configured to automatically adjust the time when needed.

Time Zone: Select the Time Zone from the drop-down menu.

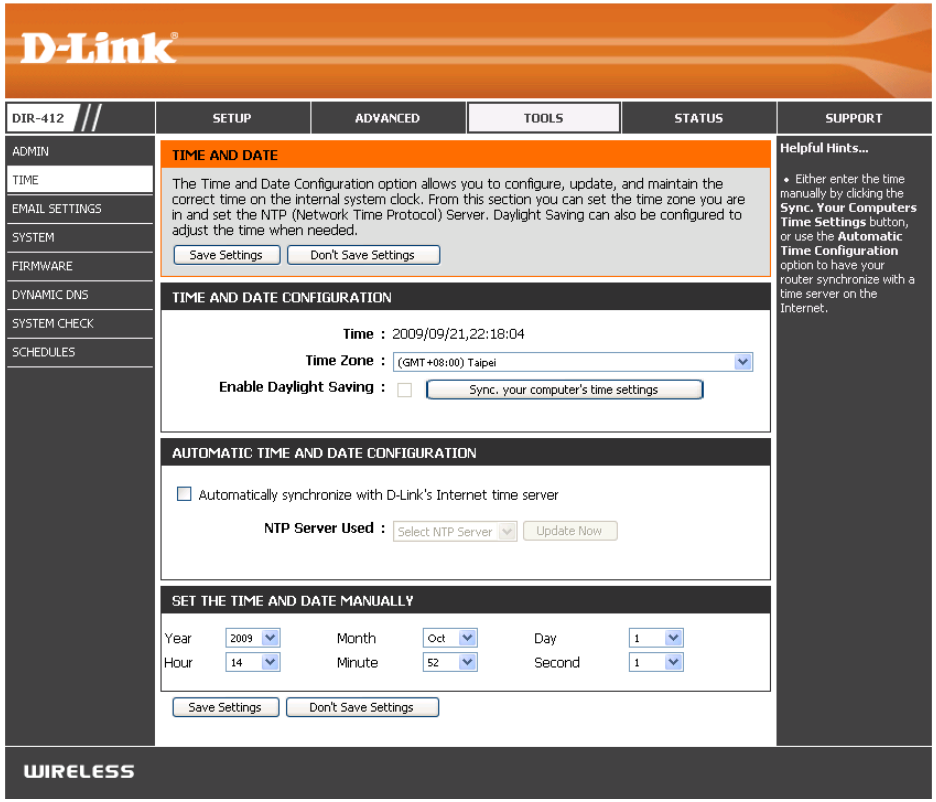
Enable Daylight Saving: Check the box to enable Daylight Saving time.

Sync your Computer's Time Settings: Click this button to set the device's time the same to local PC.

Automatic Time and Date Configuration: Check the box to enable the device to automatically synchronize with a D-Link NTP Server. NTP stands for Network Time Protocol. NTP synchronizes computer clock times in a network of computers. This will only connect to a server on the Internet, not a local server.

NTP Server Used: Select one of the D-Link NTP Servers from the drop-down menu. The DIR-412 will then synchronize it's clock to be the same time as the D-Link Internet time server. Click the **Update Now** button to synchronize with the D-Link Internet time server immediatley.

Set the Time and Date Manually: To manually input the time, use the drop-down menus to enter the values in these fields for the Year, Month, Day, Hour, Minute, and Second.


D-Link
DIR-412
SETUP
ADVANCED
TOOLS
STATUS
SUPPORT
ADMIN
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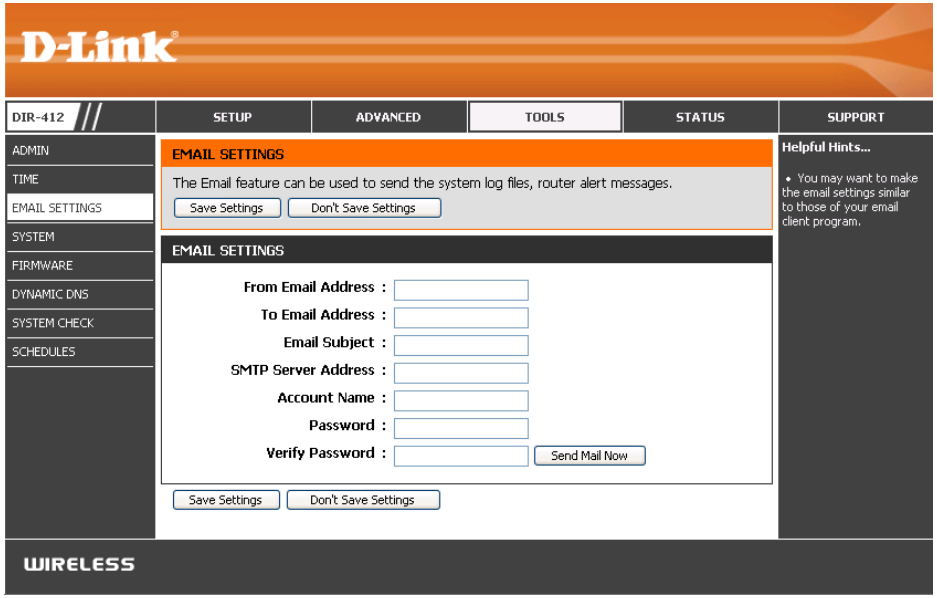
EMAIL SETTINGS
SYSTEM
FIRMWARE
DYNAMIC DNS
SYSTEM CHECK
SCHEDULES
TIME AND DATE
The Time and Date Configuration option allows you to configure, update, and maintain the correct time on the internal system clock. From this section you can set the time zone you are in and set the NTP (Network Time Protocol) Server. Daylight Saving can also be configured to adjust the time when needed.
Save Settings
Don't Save Settings
TIME AND DATE CONFIGURATION
Time : 2009/09/21,22:18:04
Time Zone : (GMT+08:00) Taipei
Enable Daylight Saving :
Sync. your computer's time settings
AUTOMATIC TIME AND DATE CONFIGURATION
Automatically synchronize with D-Link's Internet time server
NTP Server Used :
Select NTP Server
Update Now
SET THE TIME AND DATE MANUALLY
Year 2009 Month Oct Day 1
Hour 14 Minute 52 Second 1
Save Settings
Don't Save Settings
Helpful Hints...
• Either enter the time manually by clicking the Sync. Your Computers Time Settings button, or use the Automatic Time Configuration option to have your router synchronize with a time server on the Internet.
WIRELESS

Click the **Save Settings** button to save any changes made.

E-mail Settings

The E-mail feature can be used to send the system log files, router alert messages, and firmware update notification to your e-mail address.



From E-mail Address: This e-mail address will appear as the sender when you receive a log file or firmware upgrade notification via e-mail.

To E-mail Address: Enter the e-mail address where you want the e-mail sent.

E-mail Subject: Enter a subject for the e-mails that will be sent from the Router.

SMTP Server Address: Enter the IP address of the SMTP server for sending e-mail.

Account Name: Enter your account name for sending e-mail.

Password: Enter the password associated with the account.
Re-type the password associated with the account in the **Verify Password** field.

Send Mail Now: Click the **Send Mail Now** button to send a test message from the Router to the specified e-mail address.

System Settings

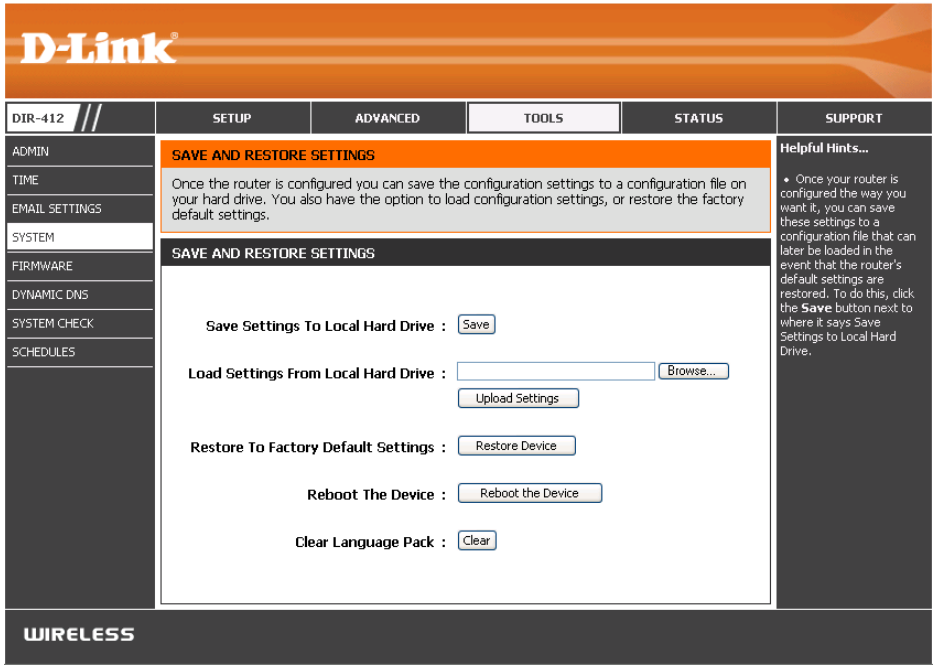
Save Settings to Local Hard Drive: Use this option to save the current router configuration settings to a file on the hard disk of the computer you are using. First, click the **Save** button. You will then see a file dialog, where you can select a location and file name for the settings.

Load Settings from Local Hard Drive: Use this option to load previously saved router configuration settings. First, use the **Browse** control to find a previously save file of configuration settings. Then, click the **Load** button to transfer those settings to the router.

Restore to Factory Default Settings: Click the **Restore** button to restore all configuration settings back to the settings that were in effect at the time the router was shipped from the factory. Any settings that have not been saved will be lost, including any rules that you have created. If you want to save the current router configuration settings, use the **Save** button above.

Reboot the Device: Click to reboot the router.

Clear Language Pack: Click the **Clear** button to restore the device back to the English interface version and remove other languages installed for the system web pages.


D-Link
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SYSTEM CHECK
SCHEDULES
SAVE AND RESTORE SETTINGS
Once the router is configured you can save the configuration settings to a configuration file on your hard drive. You also have the option to load configuration settings, or restore the factory default settings.
SAVE AND RESTORE SETTINGS
Save Settings To Local Hard Drive :
Save
Load Settings From Local Hard Drive :
Browse...
Upload Settings
Restore To Factory Default Settings :
Restore Device
Reboot The Device :
Reboot the Device
Clear Language Pack :
Clear
Helpful Hints...
• Once your router is configured the way you want it, you can save these settings to a configuration file that can later be loaded in the event that the router's default settings are restored. To do this, click the Save button next to where it says Save Settings to Local Hard Drive.
WIRELESS

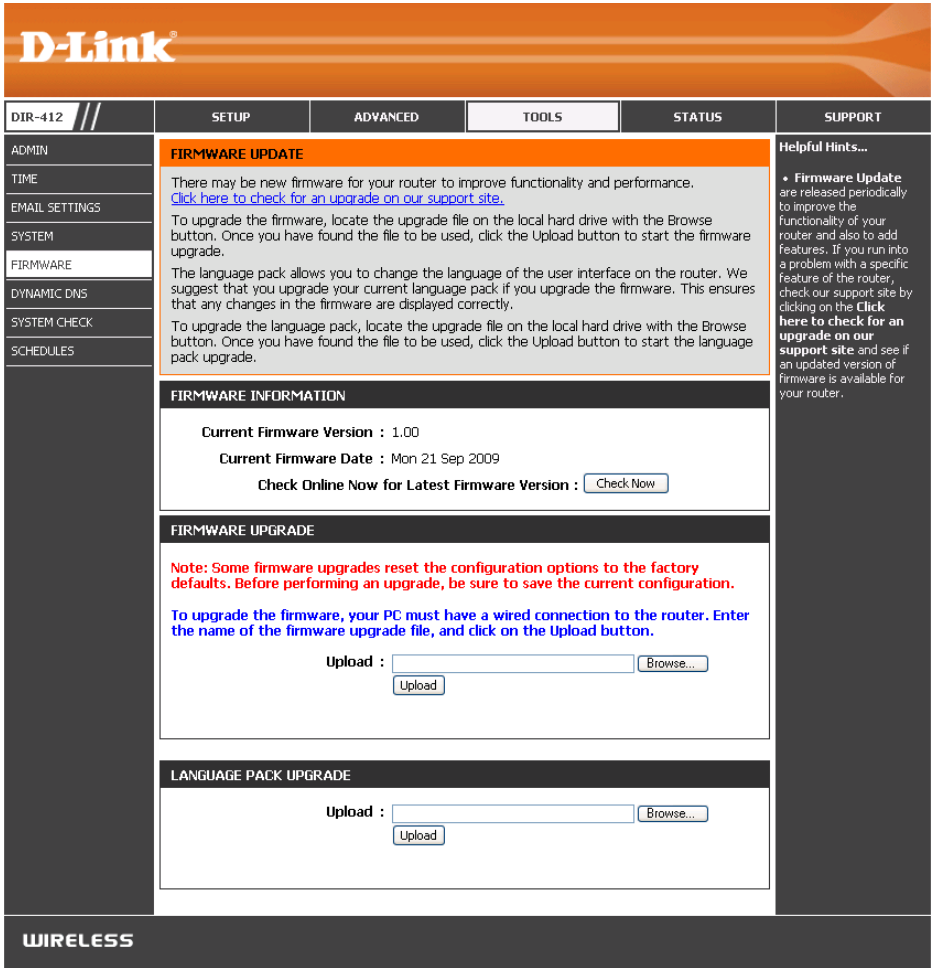
Update Firmware

You can upgrade the firmware of the Router here. Make sure the firmware you want to use is on the local hard drive of the computer. Click on **Browse** to locate the firmware file to be used for the update. Please check the D-Link support site for firmware updates at http://support.dlink.com. You can download firmware upgrades to your hard drive from the D-Link support site.

Firmware Information: Displays the current firmware version and date. You can also check the availability of a new firmware version online.

Firmware Upgrade: After you have downloaded the new firmware, click the **Browse** control to locate the firmware update on your hard drive. Click **Upload** to complete the firmware upgrade.

Language Pack Upgrade: This function allows the user to transfer the language of the GUI from English to their own language by upgrading the language pack. Click the **Browse** control to locate the desired language pack on your hard drive. Click **Upload** to complete the language pack upgrade.


D-Link
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FIRMWARE
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SYSTEM CHECK
SCHEDULES
FIRMWARE UPDATE
There may be new firmware for your router to improve functionality and performance.
Click here to check for an upgrade on our support site.
To upgrade the firmware, locate the upgrade file on the local hard drive with the Browse button. Once you have found the file to be used, click the Upload button to start the firmware upgrade.
The language pack allows you to change the language of the user interface on the router. We suggest that you upgrade your current language pack if you upgrade the firmware. This ensures that any changes in the firmware are displayed correctly.
To upgrade the language pack, locate the upgrade file on the local hard drive with the Browse button. Once you have found the file to be used, click the Upload button to start the language pack upgrade.
FIRMWARE INFORMATION
Current Firmware Version : 1.00
Current Firmware Date : Mon 21 Sep 2009
Check Online Now for Latest Firmware Version : Check Now
FIRMWARE UPGRADE
Note: Some firmware upgrades reset the configuration options to the factory defaults. Before performing an upgrade, be sure to save the current configuration.
To upgrade the firmware, your PC must have a wired connection to the router. Enter the name of the firmware upgrade file, and click on the Upload button.
Upload : Browse...
Upload
LANGUAGE PACK UPGRADE
Upload : Browse...
Upload
Helpful Hints...
• Firmware Update are released periodically to improve the functionality of your router and also to add features. If you run into a problem with a specific feature of the router, check our support site by clicking on the Click here to check for an upgrade on our support site and see if an updated version of firmware is available for your router.
WIRELESS

DDNS

The DDNS feature allows you to host a server (Web, FTP, Game Server, etc…) using a domain name that you have purchased (www.whateveryournameis.com) with your dynamically assigned IP address. Most broadband Internet Service Providers assign dynamic (changing) IP addresses. Using a DDNS service provider, your friends can enter in your domain name to connect to your server no matter what your IP address is.

Enable DDNS: Dynamic Domain Name System is a method of keeping a domain name linked to a changing IP Address. Check the box to enable DDNS.

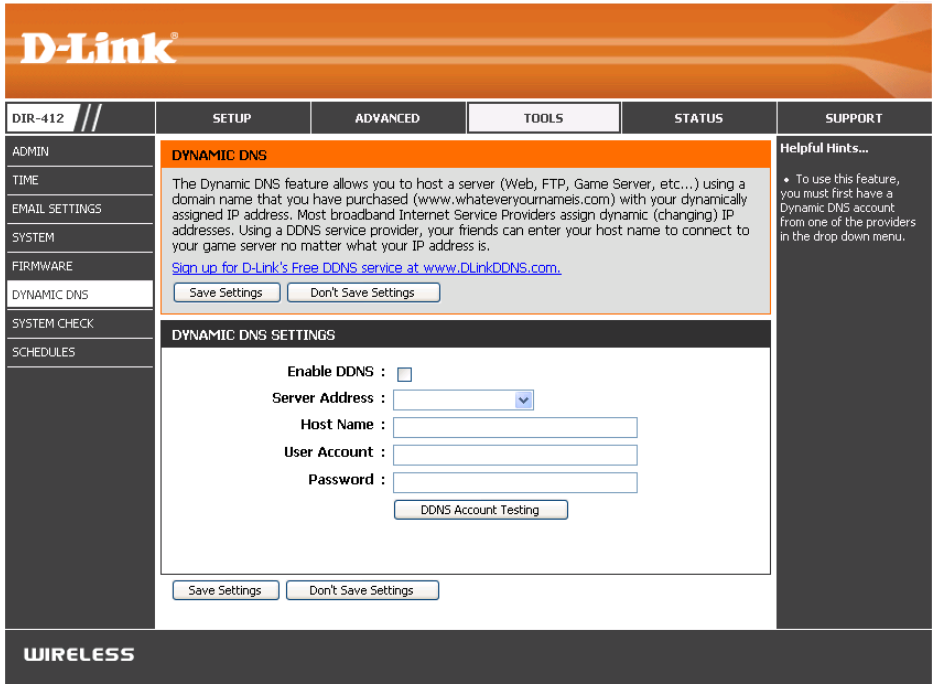
Server Address: Choose your DDNS provider from the drop down menu.

Host Name: Enter the Host Name that you registered with your DDNS service provider.

User Account: Enter the User Name for your DDNS account.

Password: Enter the Password for your DDNS account.

DDNS Account Testing: This is to test if the DDNS account is valid for use.


D-Link
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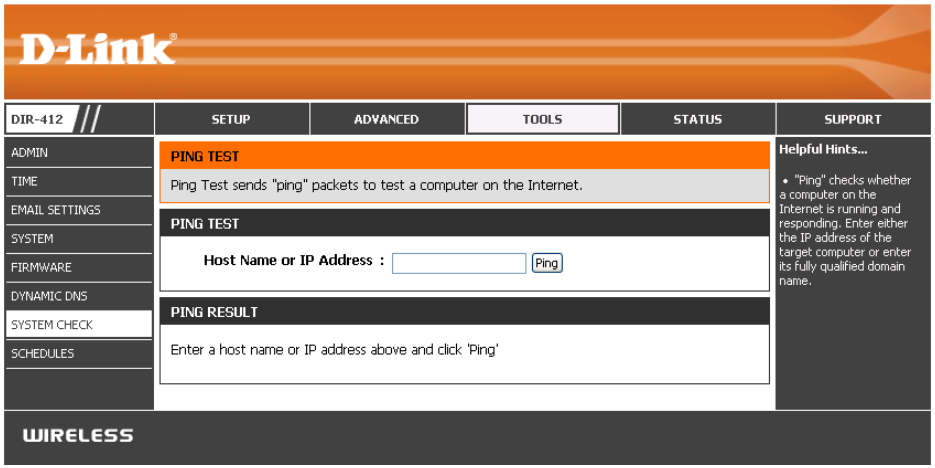
SYSTEM CHECK
SCHEDULES
DYNAMIC DNS
The Dynamic DNS feature allows you to host a server (Web, FTP, Game Server, etc...) using a domain name that you have purchased (www.whateveryournameis.com) with your dynamically assigned IP address. Most broadband Internet Service Providers assign dynamic (changing) IP addresses. Using a DDNS service provider, your friends can enter your host name to connect to your game server no matter what your IP address is.
Sign up for D-Link's Free DDNS service at www.DLinkDDNS.com.
Save Settings
Don't Save Settings
DYNAMIC DNS SETTINGS
Enable DDNS :
Server Address :
Host Name :
User Account :
Password :
DDNS Account Testing
Save Settings
Don't Save Settings
Helpful Hints...
• To use this feature, you must first have a Dynamic DNS account from one of the providers in the drop down menu.
WIRELESS

System Check

The System Check feature allows you to verify the physical connectivity on both the LAN and Internet interface.

Ping Test: The Ping Test is used to send Ping packets to test if a computer is on the Internet. Enter the IP Address that you wish to Ping, and click **Ping**.

Ping Results: The results of your ping attempts will be displayed here.



Schedules

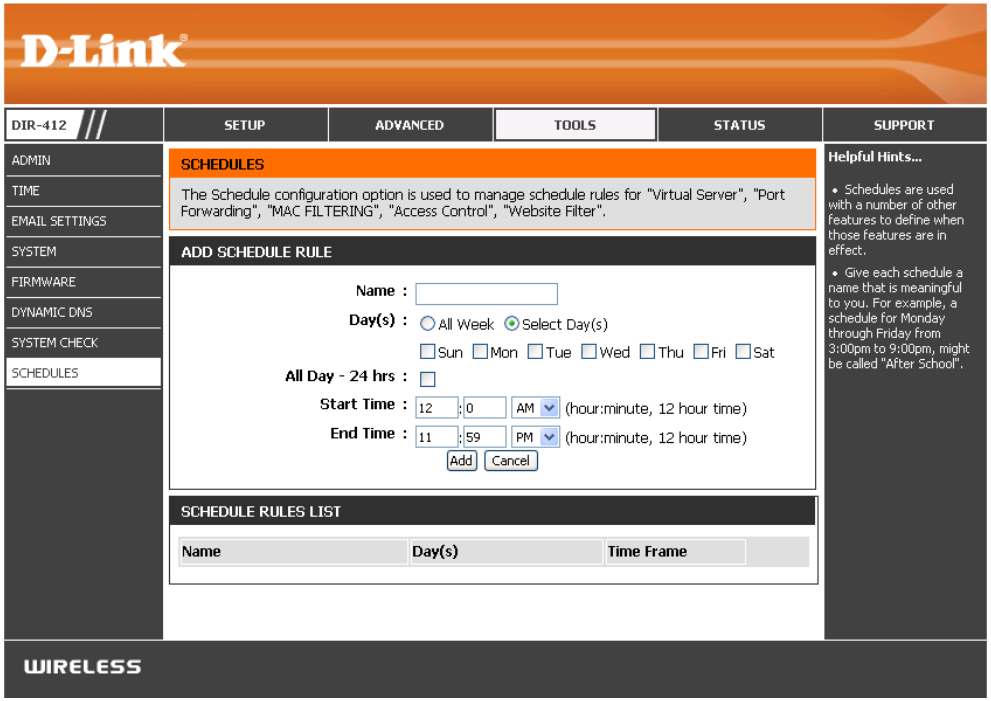
Name: Enter a name for your new schedule.

Days: Select a day, a range of days, or All Week to include every day.

Time: Check **All Day - 24hrs** or use the **Start Time** and **End Time** fields to specify the start and end time for your schedule.

Add: Click **Add** to add your schedule.

Schedule Rules List: The list of schedules will be listed here. Click the **Edit** icon to make changes or click the **Delete** icon to remove the schedule.


D-Link
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SETUP
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SYSTEM
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DYNAMIC DNS
SYSTEM CHECK
SCHEDULES
SCHEDULES
The Schedule configuration option is used to manage schedule rules for "Virtual Server", "Port Forwarding", "MAC FILTERING", "Access Control", "Website Filter".
ADD SCHEDULE RULE
Name :
Day(s) : All Week Select Day(s)
Sun Mon Tue Wed Thu Fri Sat
All Day - 24 hrs :
Start Time : 12 : 0 AM (hour:minute, 12 hour time)
End Time : 11 : 59 PM (hour:minute, 12 hour time)
Add Cancel
SCHEDULE RULES LIST
Name
Day(s)
Time Frame
Helpful Hints...
• Schedules are used with a number of other features to define when those features are in effect.
• Give each schedule a name that is meaningful to you. For example, a schedule for Monday through Friday from 3:00pm to 9:00pm, might be called "After School".
WIRELESS

Device Information

This page displays the current information for the DIR-412. It will display the LAN, WAN (Internet), and Wireless information.

If your Internet connection is set up for a Dynamic IP address then a **Release** button and a **Renew** button will be displayed. Use **Release** to disconnect from your ISP and use **Renew** to connect to your ISP.

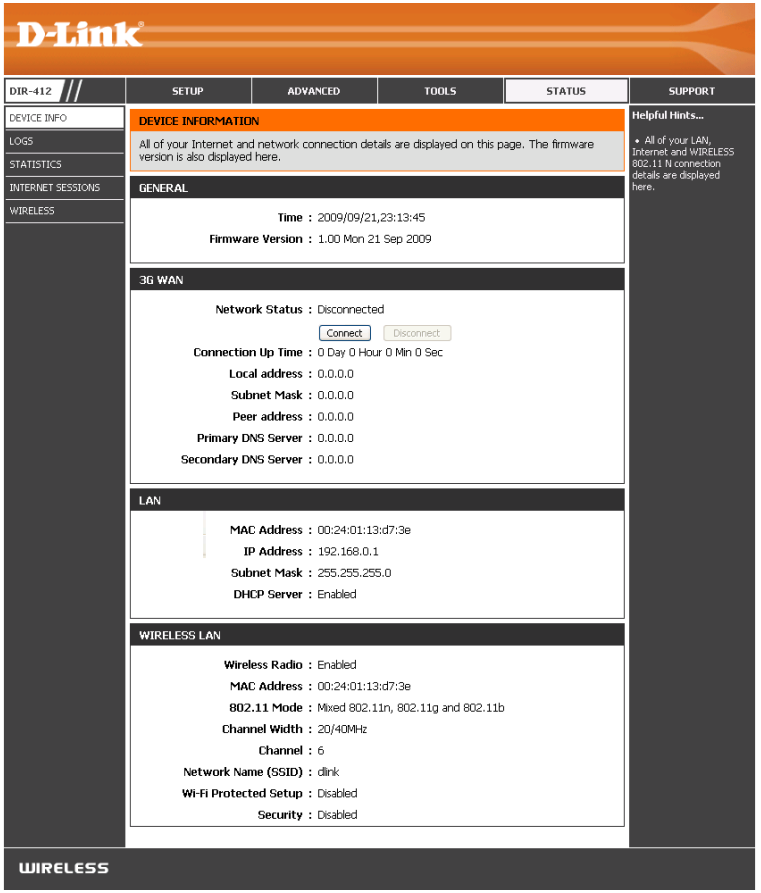
If your Internet connection is set up for PPPoE, PPTP, L2TP, Russia PPTP, or Russia PPPoE a **Connect** button and a **Disconnect** button will be displayed. Use **Disconnect** to drop the Internet connection and use **Connect** to establish the Internet connection.

General: Displays the router's time and firmware version.

3G WAN: Displays the MAC address and the public IP settings for the router.

LAN: Displays the MAC address and the private (local) IP settings for the router.

Wireless LAN: Displays the wireless MAC address and your wireless settings such as SSID and Channel.



Logs

The router automatically logs (records) events of possible interest in it's internal memory. If there isn't enough internal memory for all events, logs of older events are deleted but logs of the latest events are retained. The Logs option allows you to view the router logs. You can define what types of events you want to view and the level of the events to view. This router also has external Syslog Server support so you can send the log files to a computer on your network that is running a Syslog utility.

Log Type: Use the radio buttons to choose the types of messages that should be displayed from the log. System, Firewall & Security, and Router Status messages can be selected.

Log Level: There are three levels of message importance: Informational, Warning, and Critical. Use the radio buttons to select the levels that should be displayed in the log.

First Page: Click this button to view the first page of the log file.

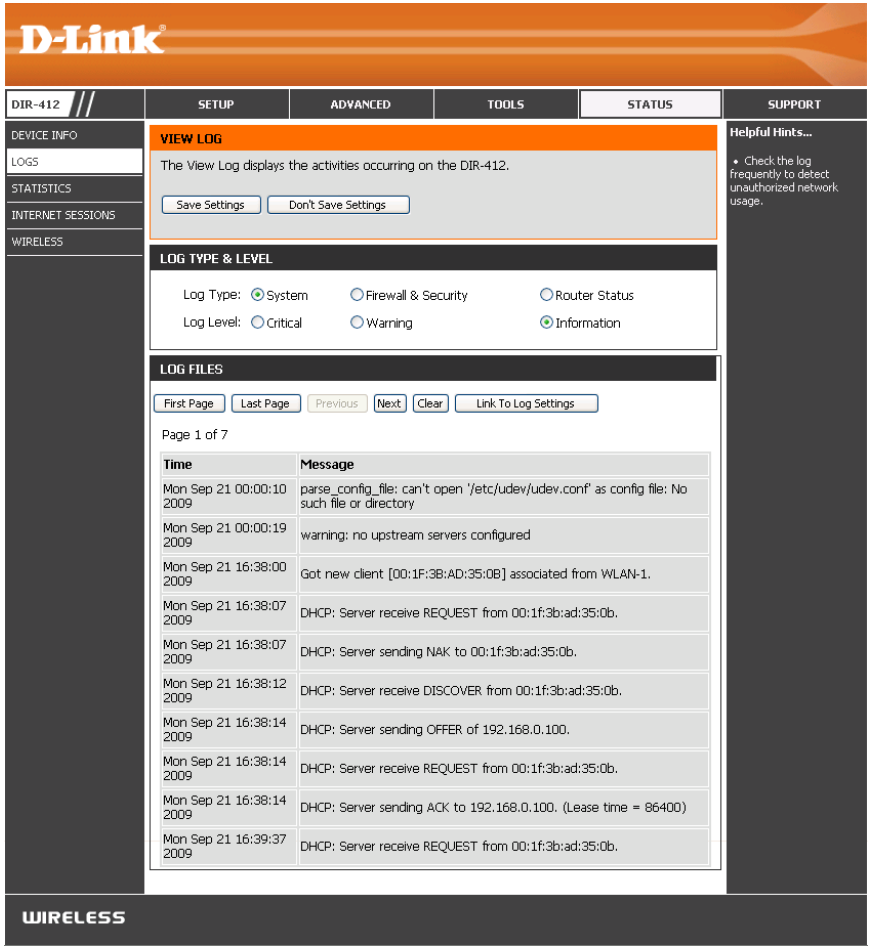
Last Page: Click this button to view the last page of the log file.

Previous: Click this button to view the previous page of the log file.

Next: Click this button to view the next page of the log file.

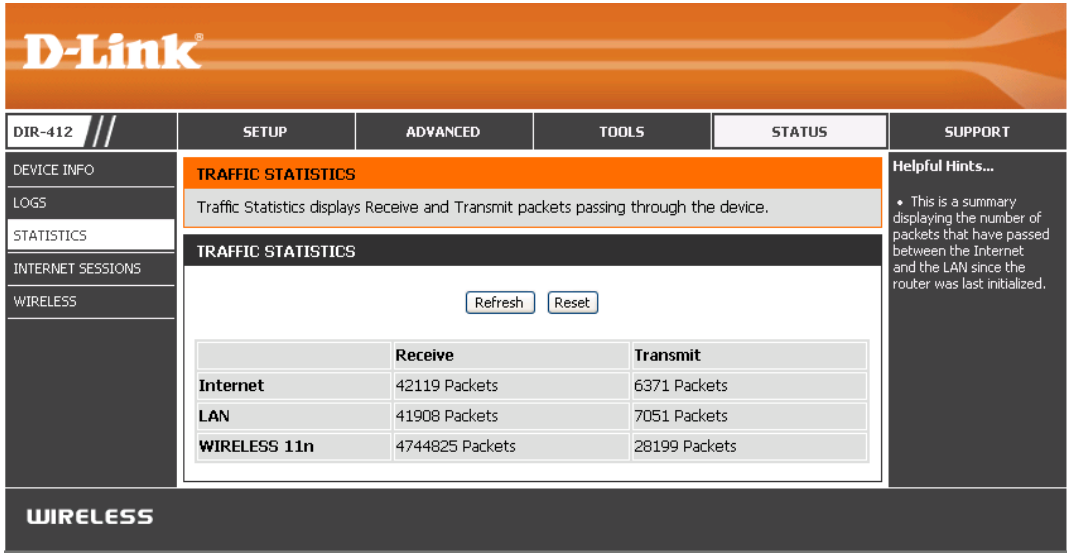
Clear: Clears all of the log contents.

Link to Log Settings: The user can click the button to "link to log settings" and save the logs to a local hard drive or to a Syslog server.



Statistics

The screen below displays the Traffic Statistics. Here you can view the amount of packets that pass through the DIR-412 on the Internet, LAN and Wireless connections. The traffic counter will reset if the device is rebooted.

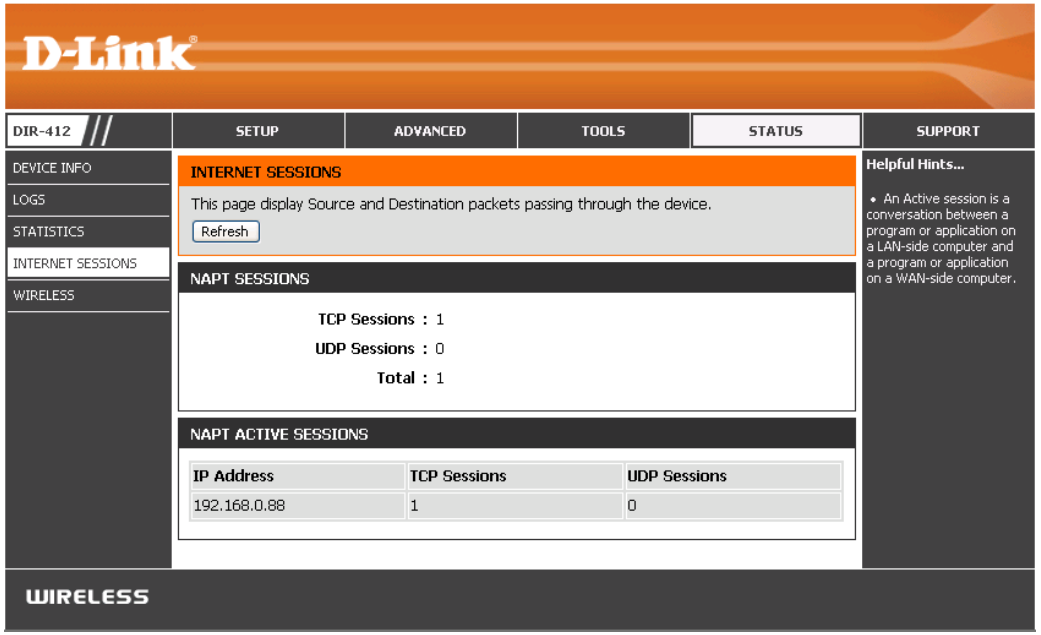


Internet Sessions

The Internet Sessions page displays full details of active Internet sessions through your router. An Internet session is a conversation between a program or application on a LAN-side computer and a program or application on a WAN-side computer.

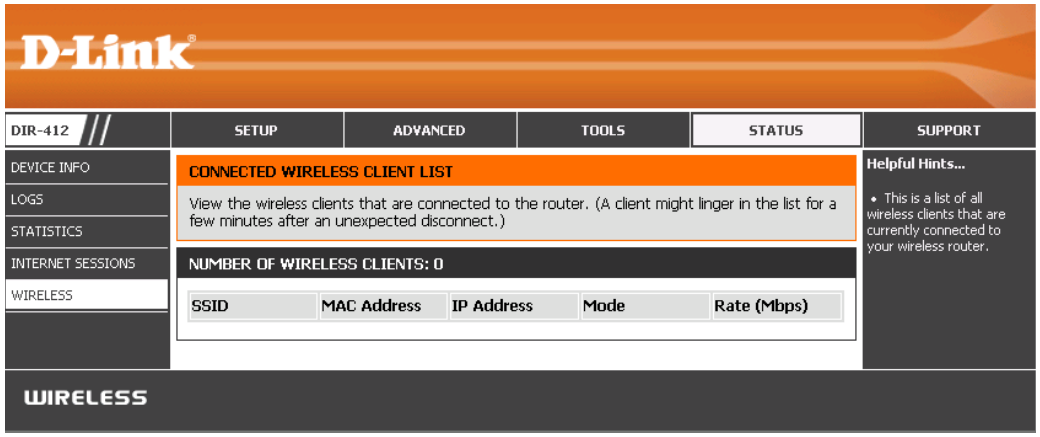
NAPT Sessions: Displays information about the NAPT Sessions on the router. Including the number of TCP Sessions, the number of UDP Sessions, and the combined number TCP and UDP NAPT Sessions.

NAPT Active Sessions: Displays the IP address of the local application and the TCP/UDP packets being sent by the source IP address for each NAPT Active Session.

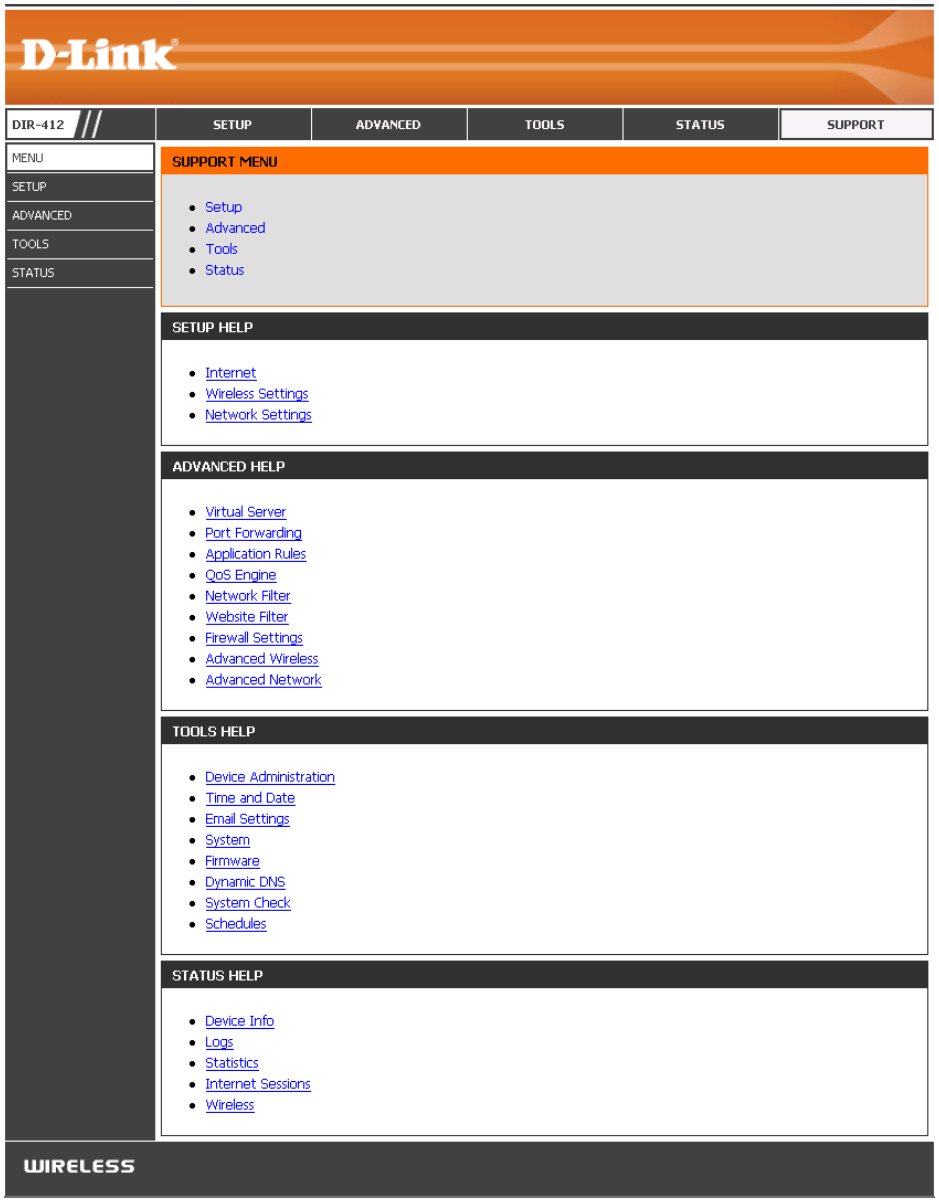


Wireless

The wireless client table displays a list of current connected wireless clients. This table also displays the connection time and MAC address of the connected wireless clients.



Support


D-Link
DIR-412
SETUP
ADVANCED
TOOLS
STATUS
SUPPORT
MENU
SETUP
ADVANCED
TOOLS
STATUS
SUPPORT MENU
Setup
Advanced
Tools
Status
SETUP HELP
Internet
Wireless Settings
Network Settings
ADVANCED HELP
Virtual Server
Port Forwarding
Application Rules
QoS Engine
Network Filter
Website Filter
Firewall Settings
Advanced Wireless
Advanced Network
TOOLS HELP
Device Administration
Time and Date
Email Settings
System
Firmware
Dynamic DNS
System Check
Schedules
STATUS HELP
Device Info
Logs
Statistics
Internet Sessions
Wireless
WIRELESS

Wireless Security

This section will show you the different levels of security you can use to protect your data from intruders. The DIR-412 offers the following types of security:

- WPA2 (Wi-Fi Protected Access 2)
- WPA (Wi-Fi Protected Access)
- WPA2-PSK(Pre-Shared Key)
- WPA-PSK (Pre-Shared Key)

What is WPA?

WPA, or Wi-Fi Protected Access, is a Wi-Fi standard that was designed to improve the security features of WEP (Wired Equivalent Privacy).

The 2 major improvements over WEP:

- Improved data encryption through the Temporal Key Integrity Protocol (TKIP). TKIP scrambles the keys using a hashing algorithm and, by adding an integrity-checking feature, ensures that the keys haven't been tampered with. WPA2 is based on 802.11i and uses Advanced Encryption Standard (AES) instead of TKIP.

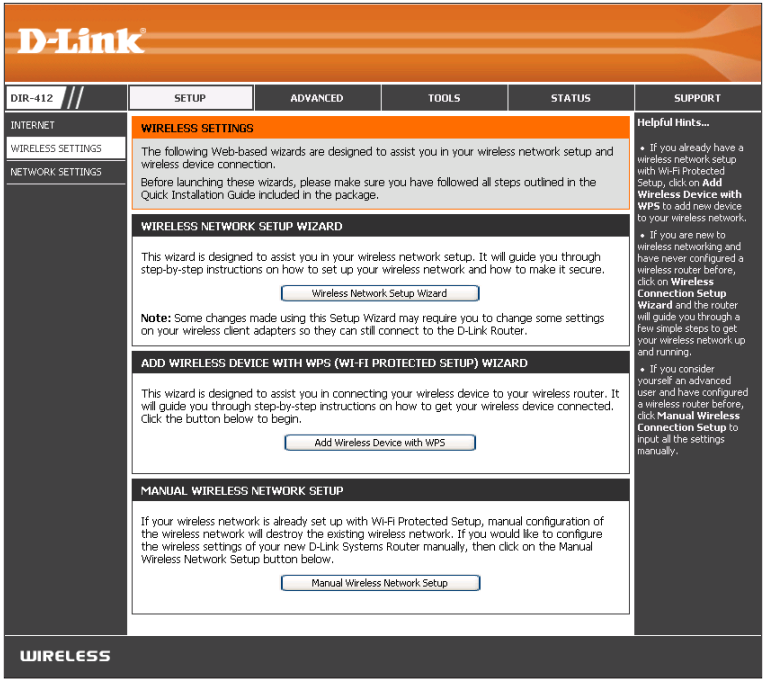
- User authentication, which is generally missing in WEP, through the extensible authentication protocol (EAP). WEP regulates access to a wireless network based on a computer's hardware-specific MAC address, which is relatively simple to be sniffed out and stolen. EAP is built on a more secure public-key encryption system to ensure that only authorized network users can access the network.

WPA-PSK/WPA2-PSK uses a passphrase or key to authenticate your wireless connection. The key is an alpha-numeric password between 8 and 63 characters long. The password can include symbols (!?*&_) and spaces. This key must be the exact same key entered on your wireless router or access point.

WPA/WPA2 incorporates user authentication through the Extensible Authentication Protocol (EAP). EAP is built on a more secure public key encryption system to ensure that only authorized network users can access the network.

Wireless Connection Setup Wizard

To run the security wizard, browse to the Setup page and then click the **Wireless Network Setup Wizard** button.


D-Link
DIR-412
SETUP
ADVANCED
TOOLS
STATUS
SUPPORT
INTERNET
WIRELESS SETTINGS
NETWORK SETTINGS
WIRELESS SETTINGS
The following Web-based wizards are designed to assist you in your wireless network setup and wireless device connection.
Before launching these wizards, please make sure you have followed all steps outlined in the Quick Installation Guide included in the package.
WIRELESS NETWORK SETUP WIZARD
This wizard is designed to assist you in your wireless network setup. It will guide you through step-by-step instructions on how to set up your wireless network and how to make it secure.
Wireless Network Setup Wizard
Note: Some changes made using this Setup Wizard may require you to change some settings on your wireless client adapters so they can still connect to the D-Link Router.
ADD WIRELESS DEVICE WITH WPS (WI-FI PROTECTED SETUP) WIZARD
This wizard is designed to assist you in connecting your wireless device to your wireless router. It will guide you through step-by-step instructions on how to get your wireless device connected. Click the button below to begin.
Add Wireless Device with WPS
MANUAL WIRELESS NETWORK SETUP
If your wireless network is already set up with Wi-Fi Protected Setup, manual configuration of the wireless network will destroy the existing wireless network. If you would like to configure the wireless settings of your new D-Link Systems Router manually, then click on the Manual Wireless Network Setup button below.
Manual Wireless Network Setup
Helpful Hints...
• If you already have a wireless network setup with Wi-Fi Protected Setup, click on Add Wireless Device with WPS to add new device to your wireless network.
• If you are new to wireless networking and have never configured a wireless router before, click on Wireless Connection Setup Wizard and the router will guide you through a few simple steps to get your wireless network up and running.
• If you consider yourself an advanced user and have configured a wireless router before, click Manual Wireless Connection Setup to input all the settings manually.
WIRELESS

Enter the SSID (Service Set Identifier). The SSID is the name of your wireless network. Create a name using up to 32 characters. The SSID is case-sensitive.

If you would like the router to automatically assign a network key to your network, click the **Automatically assign a network key** radio button.

Click **Next** to continue.

STEP 1: WELCOME TO THE D-LINK WIRELESS SECURITY SETUP WIZARD
Give your network a name, using up to 32 characters.
Wireless Network Name (SSID) :
dlink
Automatically assign a network key (Recommended)
To prevent outsiders from accessing your network, the router will automatically assign a security to your network.
Manually assign a network key
Use this options if you prefer to create our own key.
Note: All D-Link wireless adapters currently support WPA.
Prev
Next
Cancel
Save

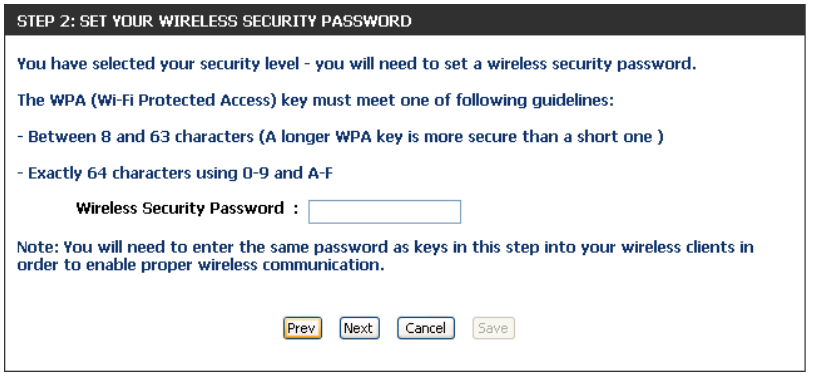
Alternatively, click the **Manually assign a network key** radio button to create your own network key.

Click **Next** to continue.

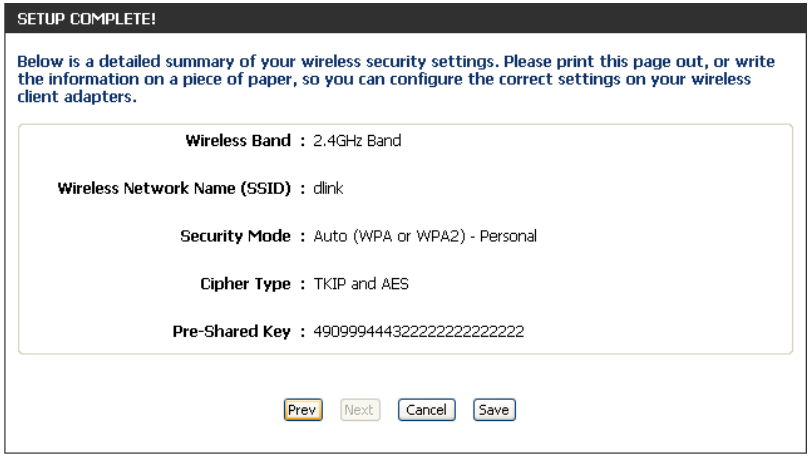
The following window appears if you selected the option to manually create your own network key.

Type a password that you would like to use for wireless security in the **Wireless Security Password** field.

Click **Next** to continue.


STEP 2: SET YOUR WIRELESS SECURITY PASSWORD
You have selected your security level - you will need to set a wireless security password.
The WPA (Wi-Fi Protected Access) key must meet one of following guidelines:
- Between 8 and 63 characters (A longer WPA key is more secure than a short one)
- Exactly 64 characters using 0-9 and A-F
Wireless Security Password :
Note: You will need to enter the same password as keys in this step into your wireless clients in order to enable proper wireless communication.
Prev
Next
Cancel
Save

The following window appears to indicate that the Wireless Connection Setup Wizard is complete.


SETUP COMPLETE!
Below is a detailed summary of your wireless security settings. Please print this page out, or write the information on a piece of paper, so you can configure the correct settings on your wireless client adapters.
Wireless Band : 2.4GHz Band
Wireless Network Name (SSID) : dlink
Security Mode : Auto (WPA or WPA2) - Personal
Cipher Type : TKIP and AES
Pre-Shared Key : 490999444322222222222222
Prev
Next
Cancel
Save

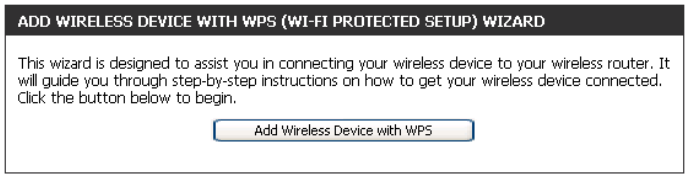
If you selected the option that automatically generated a network key, the automatically generated key will display next to the **Pre-Shared Key** field.

If you manually specified a network key, the **Wireless Security Password** that you specified will display next to the **Pre-Shared Key** field.

Click **Save** to finish the Security Wizard.

Add Wireless Device with WPS Wizard

From the **Setup** > **Wireless Settings** screen, click **Add Wireless Device with WPS**.


ADD WIRELESS DEVICE WITH WPS (WI-FI PROTECTED SETUP) WIZARD
This wizard is designed to assist you in connecting your wireless device to your wireless router. It will guide you through step-by-step instructions on how to get your wireless device connected. Click the button below to begin.
Add Wireless Device with WPS

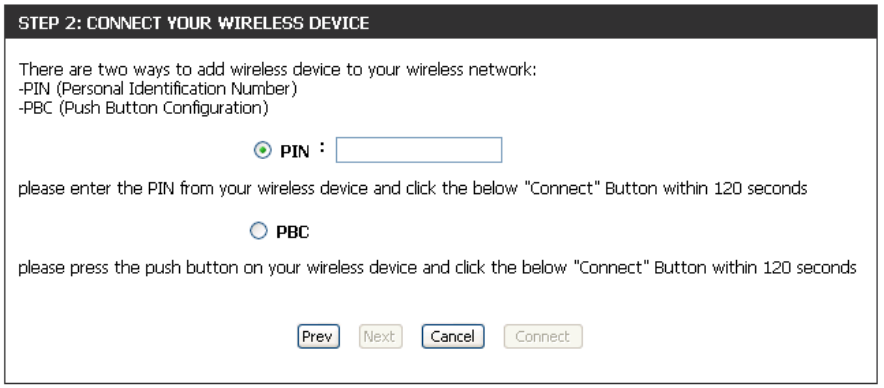
Select **Auto** to add a wireless client using WPS (Wi-Fi Protected Setup). Once you select **Auto** and click **Connect**, you will have a 120 second time limit to apply the settings to your wireless client(s) and successfully establish a connection.

If you select **Manual**, a settings summary screen will appear. Write down the security key and enter this on your wireless clients.

STEP 1: SELECT CONFIGURATION METHOD FOR YOUR WIRELESS NETWORK
Please select one of following configuration methods and click next to continue.
Auto Select this option if your wireless device supports WPS (Wi-Fi Protected Setup)
Manual Select this option will display the current wireless settings for you to configure the wireless device manually
Prev
Next
Cancel
Connect

PIN: Select this option to use PIN method. In order to use this method you must know the wireless client's 8 digit PIN and click **Connect**.

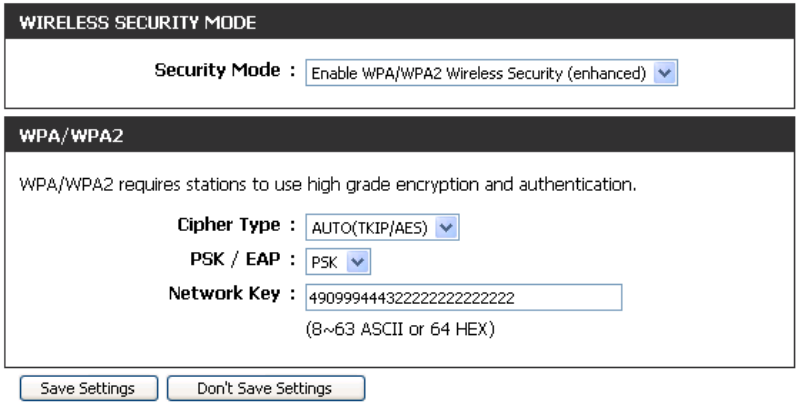
PBC: Select this option to use PBC (Push Button) method to add a wireless client. Click **Connect**.


STEP 2: CONNECT YOUR WIRELESS DEVICE
There are two ways to add wireless device to your wireless network:
-PIN (Personal Identification Number)
-PBC (Push Button Configuration)
PIN :
please enter the PIN from your wireless device and click the below "Connect" Button within 120 seconds
PBC
please press the push button on your wireless device and click the below "Connect" Button within 120 seconds
Prev
Next
Cancel
Connect

Configure WPA-Personal (PSK)

It is recommended to enable encryption on your wireless router before your wireless network adapters. Please establish wireless connectivity before enabling encryption. Your wireless signal may degrade when enabling encryption due to the added overhead.

1. Log into the web-based configuration by opening a web browser and entering the IP address of the router (192.168.0.1). Click on **Setup** and then click **Wireless Settings** on the left side and then click the **Manual Wireless Network Setup** button.



2. Select **Enable WPA/WPA2 Wireless Security (enhanced)** from the *Security Mode* drop-down menu.

3. Select **Auto(TKIP/AES)**, **TKIP**, or **AES** from the *Cipher Type* drop-down menu. If you have wireless clients that use both types, use **TKIP/AES**.

4. Select **PSK** from the *PSK / EAP* drop-down menu.

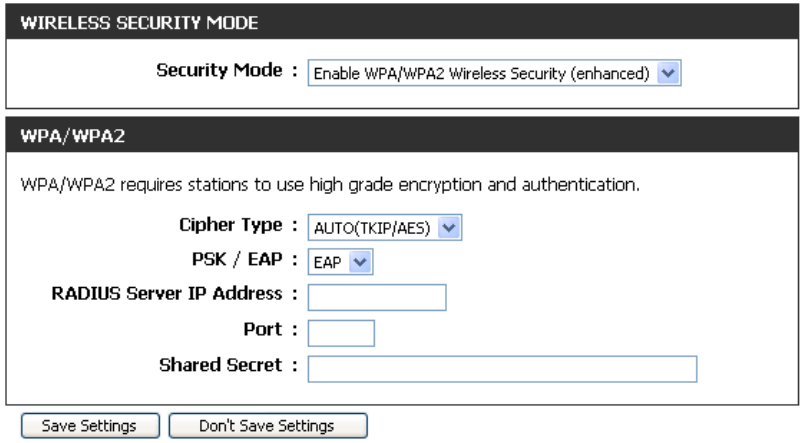
5. Enter a key (passphrase) in the *Network Key* field. The key is entered as a pass-phrase in either ASCII or HEX format. If using ASCII format the pass-phrase must be between 8-63 characters. If using HEX format the pass-phrase must be 64 characters. The ASCII or HEX pass-phrase must be the same at both ends of the wireless connection.

6. Click **Save Settings** to save your settings. If you are configuring the router with a wireless adapter, you will lose connectivity until you enable WPA-PSK on your adapter and enter the same passphrase as you did on the router.

Configure WPA-Enterprise (RADIUS)

It is recommended to enable encryption on your wireless router before your wireless network adapters. Please establish wireless connectivity before enabling encryption. Your wireless signal may degrade when enabling encryption due to the added overhead.

1. Log into the web-based configuration by opening a web browser and entering the IP address of the router (192.168.0.1). Click on **Setup** and then click **Wireless Settings** on the left side and then click the **Manual Wireless Network Setup** button.



2. Select **Enable WPA/WPA2 Wireless Security (Enhanced)** from the *Security Mode* drop-down menu.

3. Select **Auto(TKIP/AES)**, **TKIP**, or **AES** from the *Cipher Type* drop-down menu. If you have wireless clients that use both types, use **TKIP/AES**.

4. Select **EAP** from the *PSK / EAP* drop-down menu.

5. Enter the IP Address of your RADIUS server in the *RADIUS Server IP Address* field.

6. Enter the port you are using with your RADIUS server in the *Port* field.

7. Enter the security key in the *Shared Secret* field.

8. Click **Save Settings** to save your settings. If you are configuring the router with a wireless adapter, you will lose connectivity until you enable WPA-Enterprise (RADIUS) on your adapter and enter the same passphrase as you did on the router.

Connect to a Wireless Network
Using Windows® 7

It is recommended to enable wireless security (WPA/WPA2) on your wireless router or access point before configuring your wireless adapter. If you are joining an existing network, you will need to know the security key or passphrase being used.

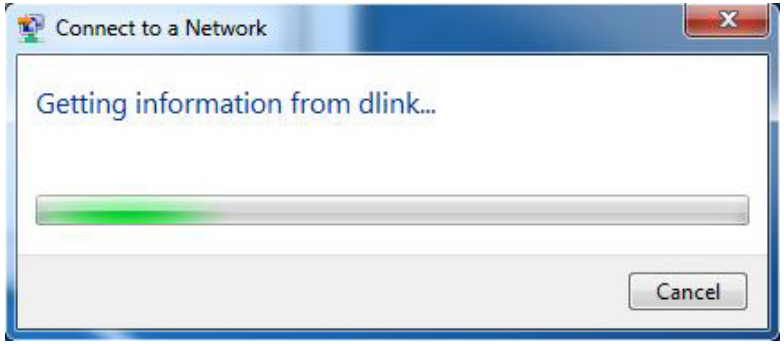
1. Click on the wireless icon in your system tray (lower-right corner).

2. The utility will display any available wireless networks in your area.

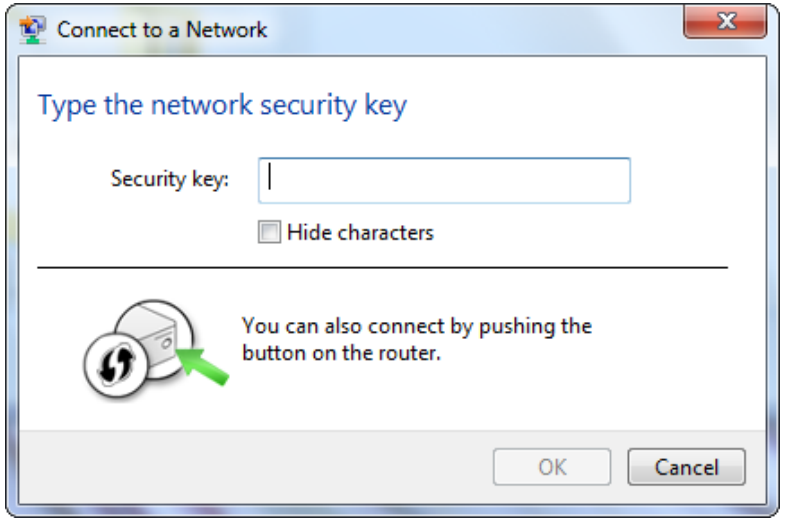
3. Highlight the wireless network (SSID) you would like to connect to and click the **Connect** button.

   If you get a good signal but cannot access the Internet, check your TCP/IP settings for your wireless adapter. Refer to the Networking Basics section in this manual for more information.

4. The following window appears while your computer tries to connect to the router.



5. Enter the same security key or passphrase that is on your router and click **Connect**. You can also connect by pushing the WPS button on the router.

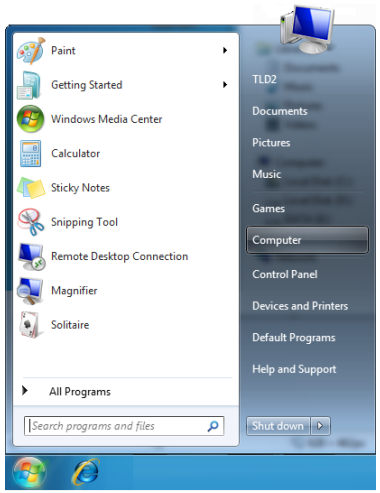


It may take 20-30 seconds to connect to the wireless network. If the connection fails, please verify that the security settings are correct. The key or passphrase must be exactly the same as on the wireless router.

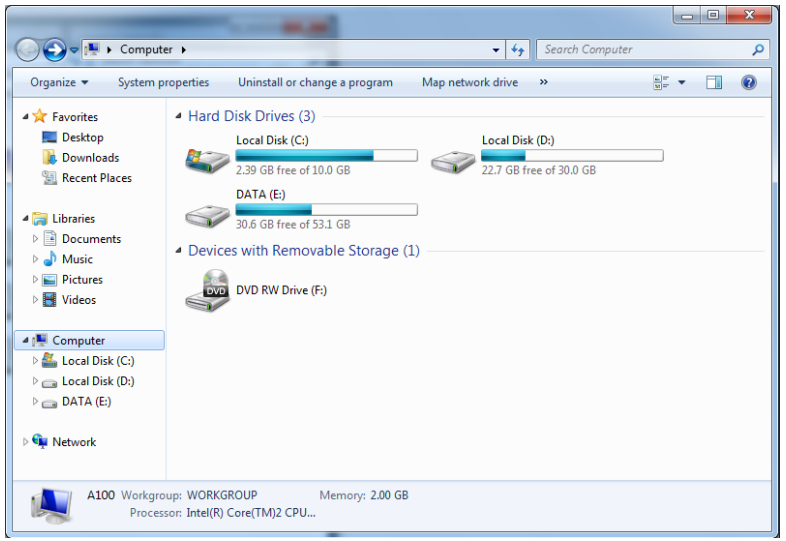
Configure WPS

The WPS feature of the DIR-412 can be configured using Windows® 7. Carry out the following steps to use Windows® 7 to configure the WPS feature:

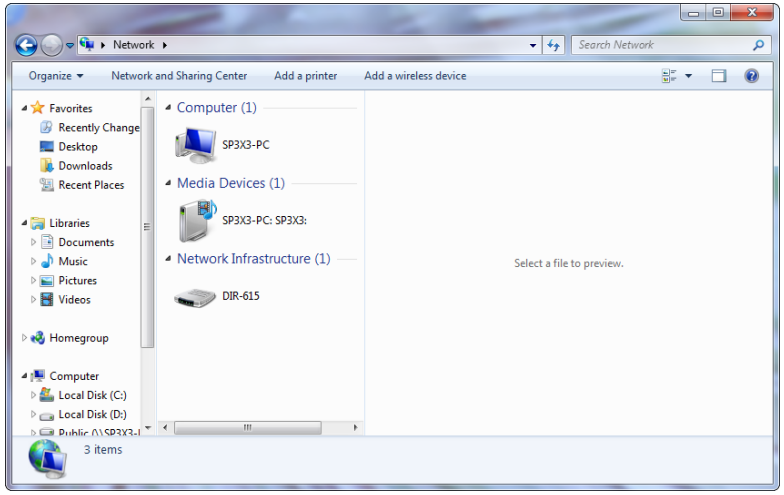
1. Click the **Start** button and select **Computer** from the Start menu.



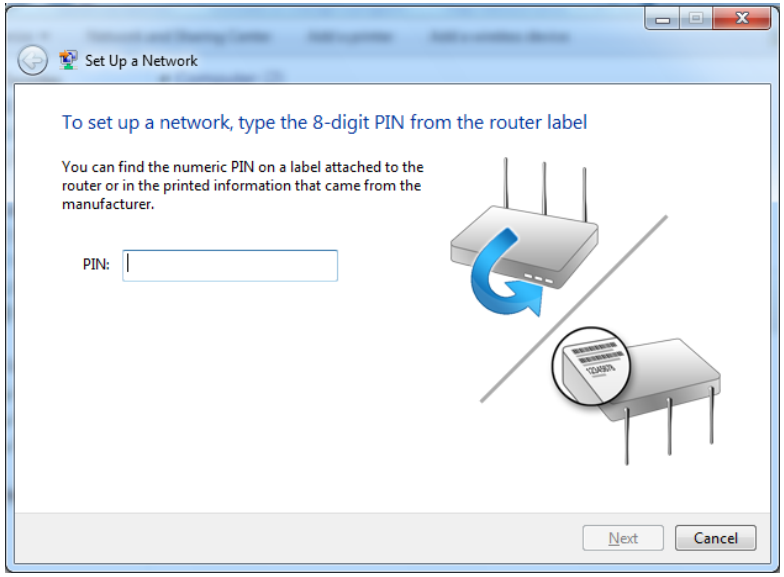
2. Click the **Network** option.



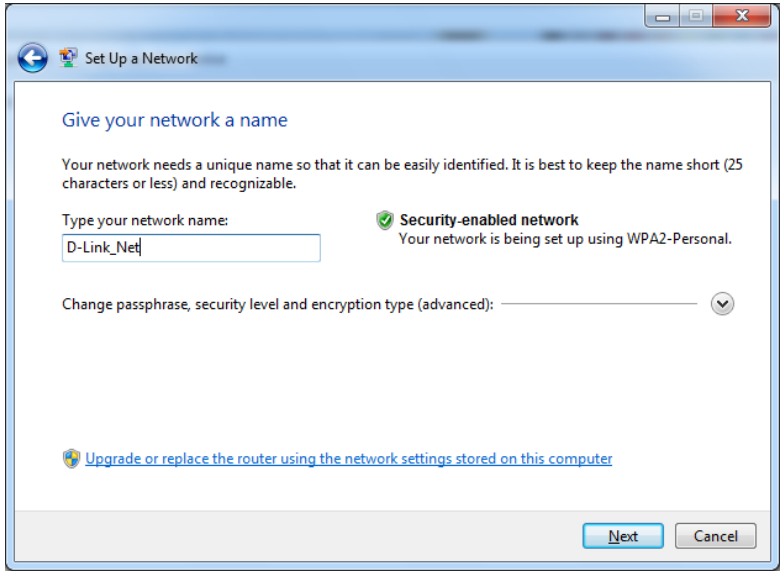
3. Double-click the DIR-412.



4. Input the WPS PIN number (displayed in the WPS window on the Router's LCD screen or in the **Setup** > **Wireless Setup** menu in the Router's Web UI) and click **Next**.

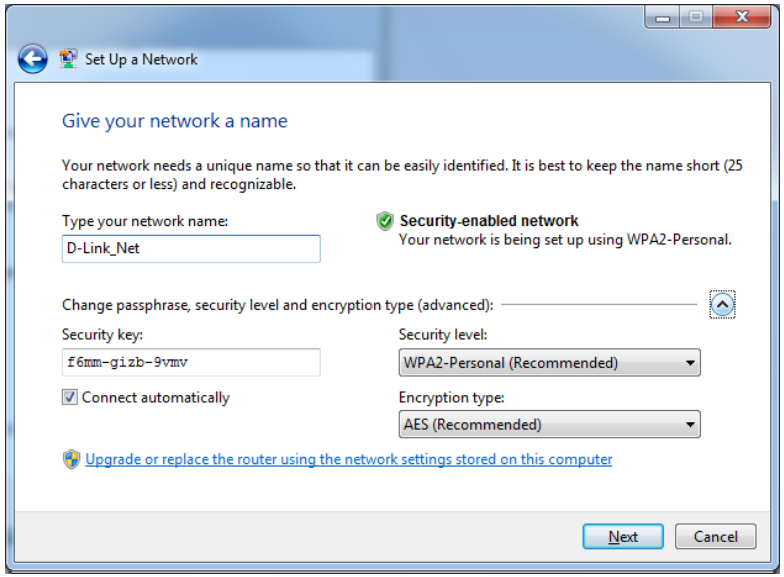

Set Up a Network
To set up a network, type the 8-digit PIN from the router label
You can find the numeric PIN on a label attached to the router or in the printed information that came from the manufacturer.
PIN:
Next
Cancel

5. Type a name to identify the network.


Set Up a Network
Give your network a name
Your network needs a unique name so that it can be easily identified. It is best to keep the name short (25 characters or less) and recognizable.
Type your network name:
D-Link_Net
Security-enabled network
Your network is being set up using WPA2-Personal.
Change passphrase, security level and encryption type (advanced):
Upgrade or replace the router using the network settings stored on this computer
Next
Cancel

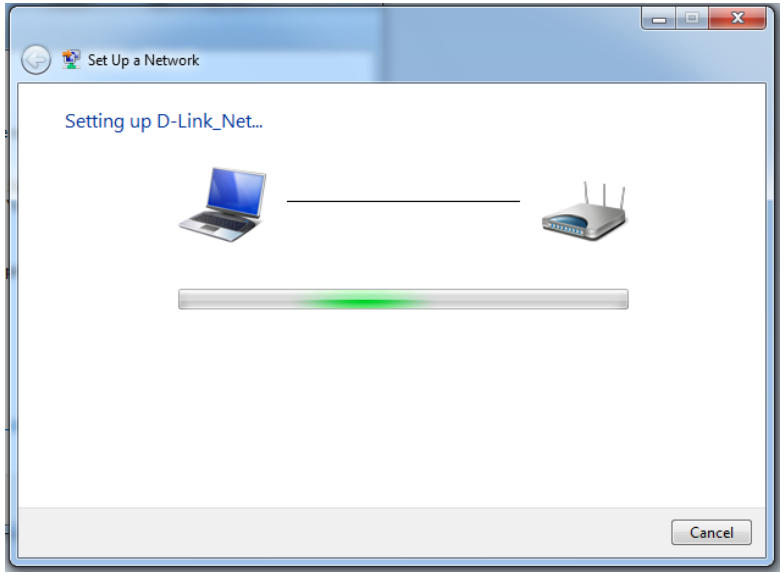
6. To configure advanced settings, click the icon.

Click **Next** to continue.


Set Up a Network
Give your network a name
Your network needs a unique name so that it can be easily identified. It is best to keep the name short (25 characters or less) and recognizable.
Type your network name:
D-Link_Net
Security-enabled network
Your network is being set up using WPA2-Personal.
Change passphrase, security level and encryption type (advanced):
Security key:
f6mm-gizb-9vmv
Security level:
WPA2-Personal (Recommended)
Connect automatically
Encryption type:
AES (Recommended)
Upgrade or replace the router using the network settings stored on this computer
Next
Cancel

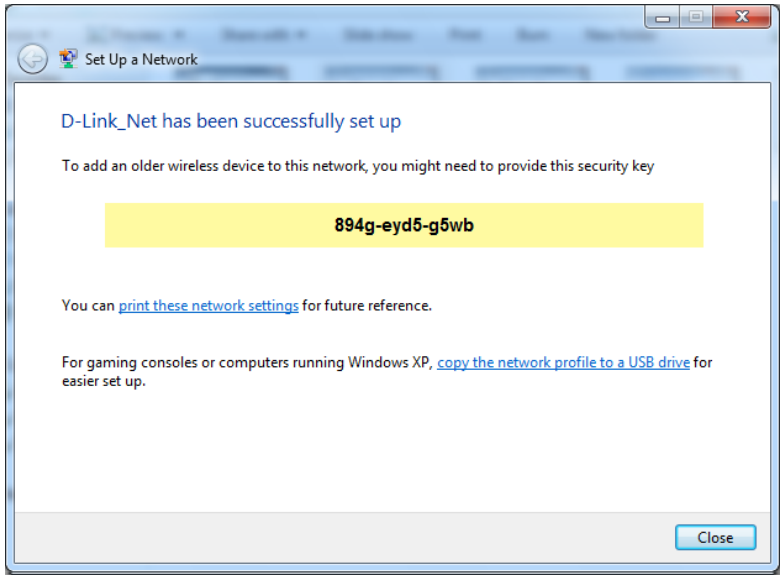
7. The following window appears while the Router is being configured.

   Wait for the configuration to complete.



8. The following window informs you that WPS on the router has been setup successfully.

   Make a note of the security key as you may need to provide this security key if adding an older wireless device to the network in the future.


Set Up a Network
D-Link_Net has been successfully set up
To add an older wireless device to this network, you might need to provide this security key
894g-eyd5-g5wb
You can print these network settings for future reference.
For gaming consoles or computers running Windows XP, copy the network profile to a USB drive for easier set up.
Close

9. Click **Close** to complete WPS setup.

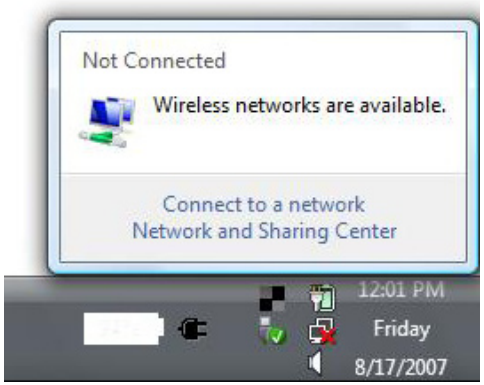
Using Windows Vista®

Windows Vista® users may use the built-in wireless utility. If you are using another company's utility or Windows® 2000, please refer to the user manual of your wireless adapter for help with connecting to a wireless network. Most utilities will have a "site survey" option similar to the Windows Vista® utility as seen below.

If you receive the **Wireless Networks Detected** bubble, click on the center of the bubble to access the utility.

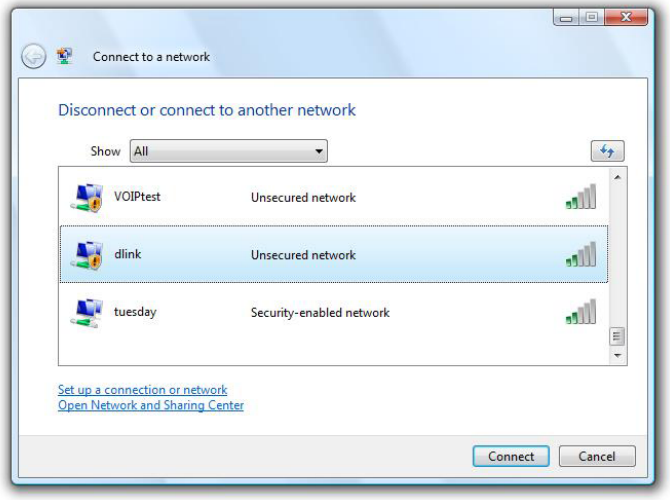
or

Right-click on the wireless computer icon in your system tray (lower-right corner next to the time). Select **Connect to a network**.



The utility will display any available wireless networks in your area. Click on a network (displayed using the SSID) and click the **Connect** button.

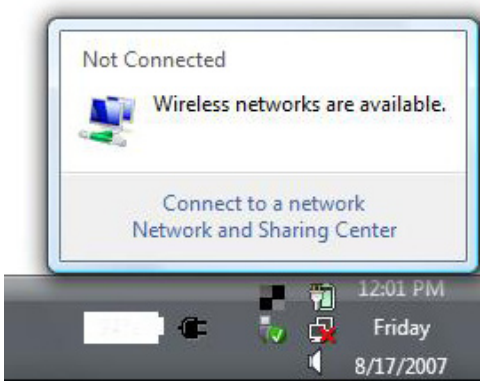
If you get a good signal but cannot access the Internet, check you TCP/IP settings for your wireless adapter. Refer to the **Networking Basics** section in this manual for more information.



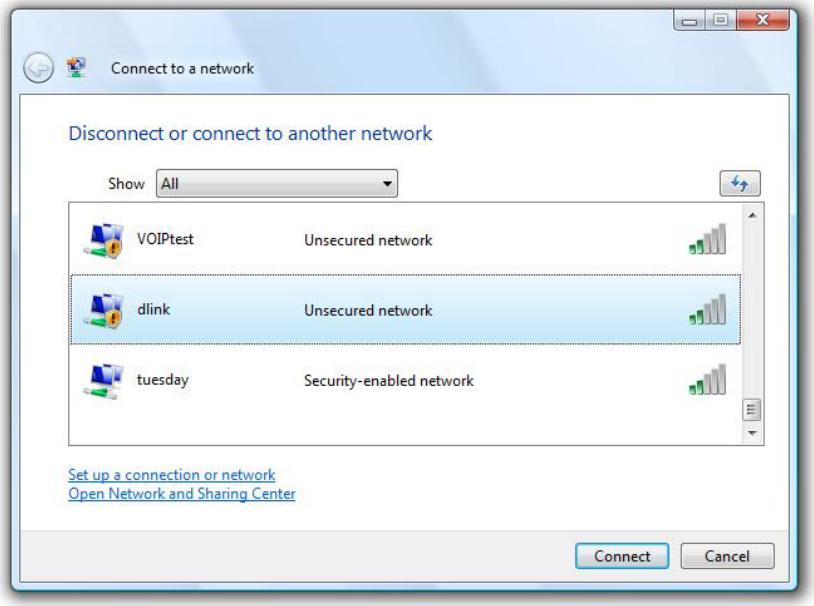
Configure WPA/WPA2

It is recommended to enable wireless security (WPA/WPA2) on your wireless router or access point before configuring your wireless adapter. If you are joining an existing network, you will need to know the security key or passphrase being used.

1. Open the Windows Vista® Wireless Utility by right-clicking on the wireless computer icon in your system tray (lower right corner of screen). Select **Connect to a network**.



2. Highlight the wireless network (SSID) you would like to connect to and click **Connect**.



3. Enter the same security key or passphrase that is on your router and click **Connect**.

It may take 20-30 seconds to connect to the wireless network. If the connection fails, please verify that the security settings are correct. The key or passphrase must be exactly the same as on the wireless router.

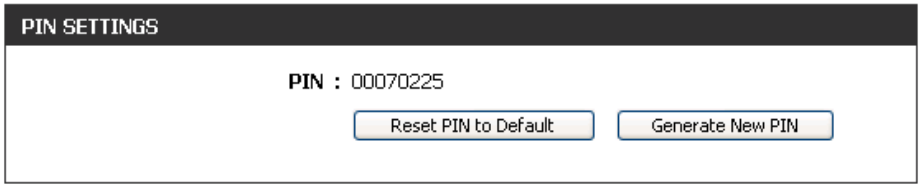
Connect to a network
Type the network security key or passphrase for Candy
The person who setup the network can give you the key or passphrase.
Security key or passphrase:
Display characters
If you have a USB flash drive with network settings for Candy, insert it now.
Connect
Cancel

Connect Using WCN 2.0

The router supports Wi-Fi protection, referred to as WCN 2.0 in Windows Vista®. The following instructions for setting this up depends on whether you are using Windows Vista® to configure the router or third party software.

When you first set up the router, Wi-Fi protection is disabled and unconfigured. To enjoy the benefits of Wi-Fi protection, the router must be both enabled and configured. There are three basic methods to accomplish this: use Windows Vista's built-in support for WCN 2.0, use software provided by a third party, or manually configure.

If you are running Windows Vista®, log into the router and click the **Enable** checkbox in the **Advanced** > **Wi-Fi Protected Setup** window. Use the Current PIN that is displayed in the **PIN Settings** section of **Advanced** > **Wi-Fi Protected Setup** window or choose to click the **Generate New PIN** button or **Reset PIN to Default** button.

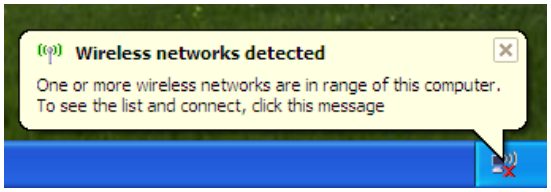


If you are using third party software to set up Wi-Fi Protection, carefully follow the directions. When you are finished, proceed to the next section to set up the newly-configured router.

Using Windows® XP

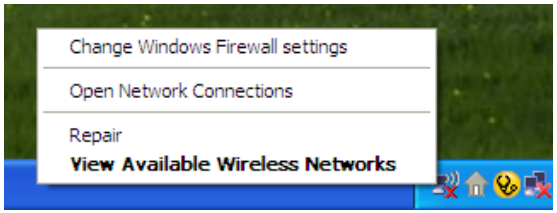
Windows® XP users may use the built-in wireless utility (Zero Configuration Utility). The following instructions are for Service Pack 2 users. If you are using another company's utility or Windows® 2000, please refer to the user manual of your wireless adapter for help with connecting to a wireless network. Most utilities will have a "site survey" option similar to the Windows® XP utility as seen below.

If you receive the **Wireless Networks Detected** bubble, click on the center of the bubble to access the utility.


Wireless networks detected
One or more wireless networks are in range of this computer.
To see the list and connect, click this message

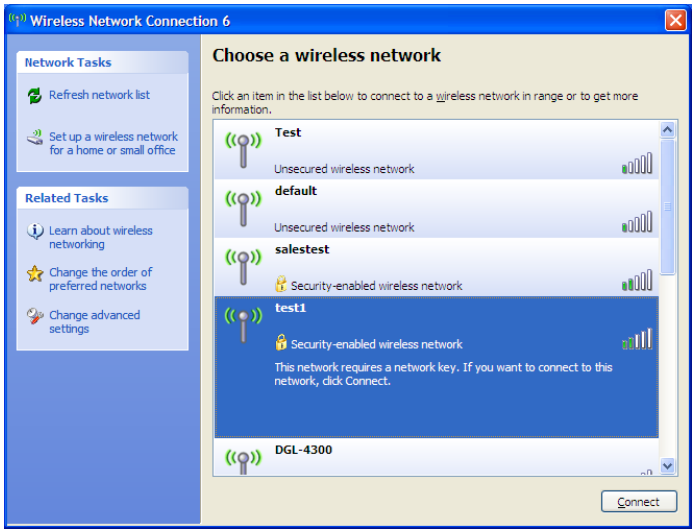
or

Right-click on the wireless computer icon in your system tray (lower-right corner next to the time). Select **View Available Wireless Networks**.



The utility will display any available wireless networks in your area. Click on a network (displayed using the SSID) and click the **Connect** button.

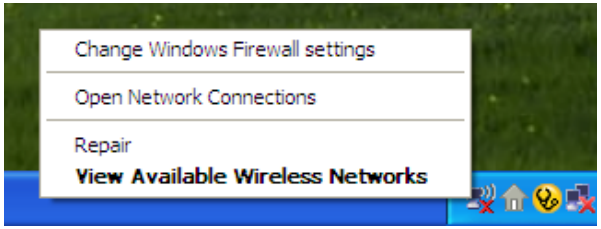
If you get a good signal but cannot access the Internet, check you TCP/IP settings for your wireless adapter. Refer to the **Networking Basics** section in this manual for more information.


Wireless Network Connection 6
Network Tasks
Refresh network list
Set up a wireless network for a home or small office
Related Tasks
Learn about wireless networking
Change the order of preferred networks
Change advanced settings
Choose a wireless network
Click an item in the list below to connect to a wireless network in range or to get more information.
Test
Unsecured wireless network
default
Unsecured wireless network
salestest
Security-enabled wireless network
test1
Security-enabled wireless network
This network requires a network key. If you want to connect to this network, click Connect.
DGL-4300
Connect

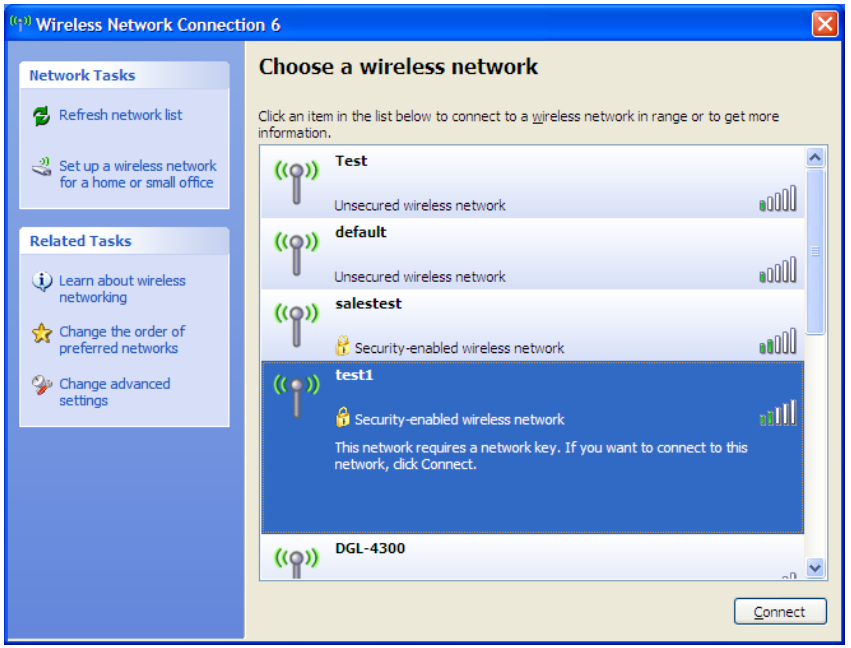
Configure WPA-PSK

It is recommended to enable WEP on your wireless router or access point before configuring your wireless adapter. If you are joining an existing network, you will need to know the WEP key being used.

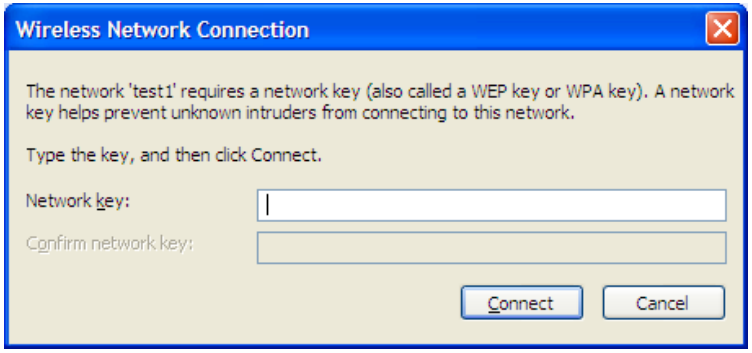
1. Open the Windows® XP Wireless Utility by right-clicking on the wireless computer icon in your system tray (lower-right corner of screen). Select **View Available Wireless Networks**.



2. Highlight the wireless network (SSID) you would like to connect to and click **Connect**.


Wireless Network Connection 6
Network Tasks
Refresh network list
Set up a wireless network for a home or small office
Related Tasks
Learn about wireless networking
Change the order of preferred networks
Change advanced settings
Choose a wireless network
Click an item in the list below to connect to a wireless network in range or to get more information.
Test
Unsecured wireless network
default
Unsecured wireless network
salestest
Security-enabled wireless network
test1
Security-enabled wireless network
This network requires a network key. If you want to connect to this network, click Connect.
DGL-4300
Connect

3. The **Wireless Network Connection** box will appear. Enter the WPA-PSK passphrase and click **Connect**.


Wireless Network Connection
The network 'test1' requires a network key (also called a WEP key or WPA key). A network key helps prevent unknown intruders from connecting to this network.
Type the key, and then click Connect.
Network key:
Confirm network key:
Connect
Cancel

It may take 20-30 seconds to connect to the wireless network. If the connection fails, please verify that the WPA-PSK settings are correct. The WPA-PSK passphrase must be exactly the same as on the wireless router.

Troubleshooting

This chapter provides solutions to problems that can occur during the installation and operation of the DIR-412. Read the following descriptions if you are having problems. (The examples below are illustrated in Windows® XP. If you have a different operating system, the screen shots on your computer will look similar to the following examples.)

1. Why can't I access the web-based configuration utility?

When entering the IP address of the D-Link router (192.168.0.1 for example), you are not connecting to a website on the Internet or have to be connected to the Internet. The device has the utility built-in to a ROM chip in the device itself. Your computer must be on the same IP subnet to connect to the web-based utility.

- Make sure you have an updated Java-enabled web browser. We recommend the following:
    - Internet Explorer 6.0 or higher
    - Safari 3.0 or higher
    - Chrome 2.0 or higher
    - Firefox 3.0 or higher
- Verify physical connectivity by checking for solid link lights on the device. If you do not get a solid link light, try using a different cable or connect to a different port on the device if possible. If the computer is turned off, the link light may not be on.
- Disable any Internet security software running on the computer. Software firewalls such as Zone Alarm, Black Ice, Sygate, Norton Personal Firewall, and Windows® XP firewall may block access to the configuration pages. Check the help files included with your firewall software for more information on disabling or configuring it.

• Configure your Internet settings:

  • Go to **Start** > **Settings** > **Control Panel**. Double-click the **Internet Options** Icon. From the **Security** tab, click the button to restore the settings to their defaults.

  • Click the **Connection** tab and set the dial-up option to Never Dial a Connection. Click the LAN Settings button. Make sure nothing is checked. Click **OK**.

  • Go to the **Advanced** tab and click the button to restore these settings to their defaults. Click **OK** three times.

  • Close your web browser (if open) and open it.

• Access the web management. Open your web browser and enter the IP address of your D-Link router in the address bar. This should open the login page for your the web management.

• If you still cannot access the configuration, unplug the power to the router for 10 seconds and plug back in. Wait about 30 seconds and try accessing the configuration. If you have multiple computers, try connecting using a different computer.

2. What can I do if I forgot my password?

If you forgot your password, you must reset your router. Unfortunately this process will change all your settings back to the factory defaults.

To reset the router, locate the reset button (hole) on the rear panel of the unit. With the router powered on, use a paperclip to hold the button down for 10 seconds. Release the button and the router will go through its reboot process. Wait about 30 seconds to access the router. The default IP address is 192.168.0.1. When logging in, the username is **admin** and leave the password box empty.

3. Why can't I connect to certain sites or send and receive e-mails when connecting through my router?

If you are having a problem sending or receiving e-mail, or connecting to secure sites such as eBay, banking sites, and Hotmail, we suggest lowering the MTU in increments of ten (Ex. 1492, 1482, 1472, etc).

Note: AOL DSL+ users must use MTU of 1400.

To find the proper MTU Size, you'll have to do a special ping of the destination you're trying to go to. A destination could be another computer, or a URL.

- Click on **Start** and then click **Run**.
- Windows® 95, 98, and Me users type in **command** (Windows® NT, 2000, and XP users type in **cmd**) and press **Enter** (or click **OK**).
- Once the window opens, you'll need to do a special ping. Use the following syntax:

ping [url] [-f] [-l] [MTU value]

Example: **ping yahoo.com -f -l 1472**

```
C:\>ping yahoo.com -f -l 1482

Pinging yahoo.com [66.94.234.13] with 1482 bytes of data:

Packet needs to be fragmented but DF set.
Packet needs to be fragmented but DF set.
Packet needs to be fragmented but DF set.
Packet needs to be fragmented but DF set.

Ping statistics for 66.94.234.13:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum =  0ms, Average =  0ms

C:\>ping yahoo.com -f -l 1472

Pinging yahoo.com [66.94.234.13] with 1472 bytes of data:

Reply from 66.94.234.13: bytes=1472 time=93ms TTL=52
Reply from 66.94.234.13: bytes=1472 time=109ms TTL=52
Reply from 66.94.234.13: bytes=1472 time=125ms TTL=52
Reply from 66.94.234.13: bytes=1472 time=203ms TTL=52

Ping statistics for 66.94.234.13:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 93ms, Maximum =  203ms, Average =  132ms

C:\>
```

You should start at 1472 and work your way down by 10 each time. Once you get a reply, go up by 2 until you get a fragmented packet. Take that value and add 28 to the value to account for the various TCP/IP headers. For example, lets say that 1452 was the proper value, the actual MTU size would be 1480, which is the optimum for the network we're working with (1452+28=1480).

Once you find your MTU, you can now configure your router with the proper MTU size.

To change the MTU rate on your router follow the steps below:

- Open your browser, enter the IP address of your router (192.168.0.1) and click **OK**.
- Enter your username (admin) and password (blank by default). Click **OK** to enter the web configuration page for the device.
- Click on **Setup>Internet** and then click **Manual Internet Connection Setup**.
- To change the MTU enter the number in the **MTU** field and click **Save Settings** to save your settings.
- Test your e-mail. If changing the MTU does not resolve the problem, continue changing the MTU in increments of ten.

Wireless Basics

D-Link wireless products are based on industry standards to provide easy-to-use and compatible high-speed wireless connectivity within your home, business or public access wireless networks. Strictly adhering to the IEEE standard, the D-Link wireless family of products will allow you to securely access the data you want, when and where you want it. You will be able to enjoy the freedom that wireless networking delivers.

A wireless local area network (WLAN) is a cellular computer network that transmits and receives data with radio signals instead of wires. Wireless LANs are used increasingly in both home and office environments, and public areas such as airports, coffee shops and universities. Innovative ways to utilize WLAN technology are helping people to work and communicate more efficiently. Increased mobility and the absence of cabling and other fixed infrastructure have proven to be beneficial for many users.

Wireless users can use the same applications they use on a wired network. Wireless adapter cards used on laptop and desktop systems support the same protocols as Ethernet adapter cards.

Under many circumstances, it may be desirable for mobile network devices to link to a conventional Ethernet LAN in order to use servers, printers or an Internet connection supplied through the wired LAN. A Wireless Router is a device used to provide this link.

What is Wireless?

Wireless or Wi-Fi technology is another way of connecting your computer to the network without using wires. Wi-Fi uses radio frequency to connect wirelessly, so you have the freedom to connect computers anywhere in your home or office network.

Why D-Link Wireless?

D-Link is the worldwide leader and award winning designer, developer, and manufacturer of networking products. D-Link delivers the performance you need at a price you can afford. D-Link has all the products you need to build your network.

How does wireless work?

Wireless works similar to how cordless phone work, through radio signals to transmit data from one point A to point B. But wireless technology has restrictions as to how you can access the network. You must be within the wireless network range area to be able to connect your computer. There are two different types of wireless networks Wireless Local Area Network (WLAN), and Wireless Personal Area Network (WPAN).

Wireless Local Area Network (WLAN)

In a wireless local area network, a device called an Access Point (AP) connects computers to the network. The access point has a small antenna attached to it, which allows it to transmit data back and forth over radio signals. With an indoor access point as seen in the picture, the signal can travel up to 300 feet. With an outdoor access point the signal can reach out up to 30 miles to serve places like manufacturing plants, industrial locations, college and high school campuses, airports, golf courses, and many other outdoor venues.

Wireless Personal Area Network (WPAN)

Bluetooth is the industry standard wireless technology used for WPAN. Bluetooth devices in WPAN operate in a range up to 30 feet away.

Compared to WLAN the speed and wireless operation range are both less than WLAN, but in return it doesn't use nearly as much power which makes it ideal for personal devices, such as mobile phones, PDAs, headphones, laptops, speakers, and other devices that operate on batteries.

Who uses wireless?

Wireless technology as become so popular in recent years that almost everyone is using it, whether it's for home, office, business, D-Link has a wireless solution for it.

Home

- Gives everyone at home broadband access
- Surf the web, check e-mail, instant message, and etc
- Gets rid of the cables around the house
- Simple and easy to use

Small Office and Home Office

- Stay on top of everything at home as you would at office
- Remotely access your office network from home
- Share Internet connection and printer with multiple computers
- No need to dedicate office space

Where is wireless used?

Wireless technology is expanding everywhere not just at home or office. People like the freedom of mobility and it's becoming so popular that more and more public facilities now provide wireless access to attract people. The wireless connection in public places is usually called "hotspots".

Using a D-Link Cardbus Adapter with your laptop, you can access the hotspot to connect to Internet from remote locations like: Airports, Hotels, Coffee Shops, Libraries, Restaurants, and Convention Centers.

Wireless network is easy to setup, but if you're installing it for the first time it could be quite a task not knowing where to start. That's why we've put together a few setup steps and tips to help you through the process of setting up a wireless network.

Tips

Here are a few things to keep in mind, when you install a wireless network.

Centralize your router or Access Point

Make sure you place the router/access point in a centralized location within your network for the best performance. Try to place the router/access point as high as possible in the room, so the signal gets dispersed throughout your home. If you have a two-story home, you may need a repeater to boost the signal to extend the range.

Eliminate Interference

Place home appliances such as cordless telephones, microwaves, and televisions as far away as possible from the router/access point. This would significantly reduce any interference that the appliances might cause since they operate on same frequency.

Security

Don't let you next-door neighbors or intruders connect to your wireless network. Secure your wireless network by turning on the WPA or WEP security feature on the router. Refer to product manual for detail information on how to set it up.

Wireless Modes

There are basically two modes of networking:

- **Infrastructure** – All wireless clients will connect to an access point or wireless router.

- **Ad-Hoc** – Directly connecting to another computer, for peer-to-peer communication, using wireless network adapters on each computer, such as two or more DIR-412 wireless network Cardbus adapters.

An Infrastructure network contains an Access Point or wireless router. All the wireless devices, or clients, will connect to the wireless router or access point.

An Ad-Hoc network contains only clients, such as laptops with wireless cardbus adapters. All the adapters must be in Ad-Hoc mode to communicate.

Networking Basics

Check your IP address

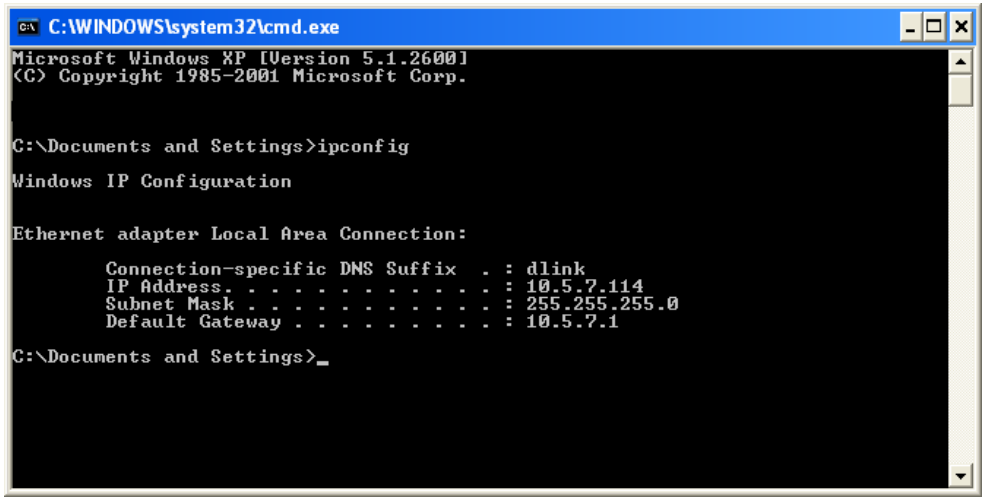
After you install your adapter, by default, the TCP/IP settings should be set to obtain an IP address from a DHCP server (i.e. wireless router) automatically. To verify your IP address, please follow the steps below.

Click on **Start** > **Run**. In the run box type ***cmd*** and click **OK.** (Windows® 7/Vista® users type *cmd* in the **Start Search** box.)

At the prompt, type ***ipconfig*** and press **Enter**.

This will display the IP address, subnet mask, and the default gateway of your adapter.

If the address is 0.0.0.0, check your adapter installation, security settings, and the settings on your router. Some firewall software programs may block a DHCP request on newly installed adapters.


C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.
C:\Documents and Settings>ipconfig
Windows IP Configuration
Ethernet adapter Local Area Connection:
Connection-specific DNS Suffix . : dlink
IP Address. . . . . : 10.5.7.114
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 10.5.7.1
C:\Documents and Settings>

Statically Assign an IP address

If you are not using a DHCP capable gateway/router, or you need to assign a static IP address, please follow the steps below:

Step 1

Windows® 7 - Click on **Start** > **Control Panel** > **Network and Internet** > **Network and Sharing Center** > **Change Adapter Setting.**

Windows Vista® - Click on **Start** > **Control Panel** > **Network and Internet** > **Network and Sharing Center** > **Manage Network Connections.**

Windows® XP - Click on **Start** > **Control Panel** > **Network Connections**.

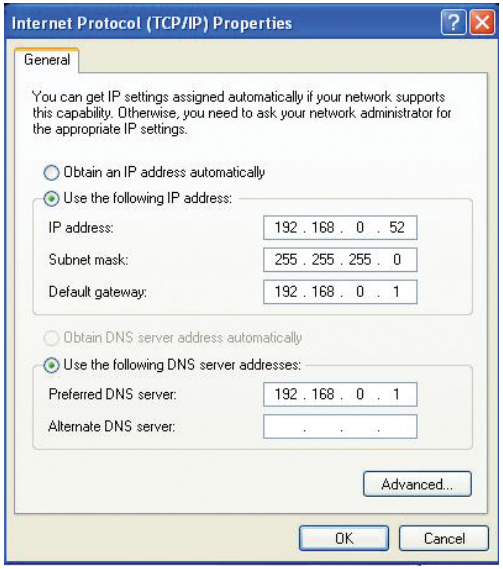
Windows® 2000 - From the desktop, right-click **My Network Places** > **Properties**.

Step 2

Right-click on the **Local Area Connection** which represents your network adapter and select **Properties**.

Step 3

Highlight **Internet Protocol (TCP/IP)** and click **Properties**.


Internet Protocol (TCP/IP) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 192 . 168 . 0 . 52
Subnet mask: 255 . 255 . 255 . 0
Default gateway: 192 . 168 . 0 . 1
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server: 192 . 168 . 0 . 1
Alternate DNS server:
Advanced...
OK
Cancel

Step 4

Click **Use the following IP address** and enter an IP address that is on the same subnet as your network or the LAN IP address on your router.

Example: If the router´s LAN IP address is 192.168.0.1, make your IP address 192.168.0.X where X is a number between 2 and 99. Make sure that the number you choose is not in use on the network. Set Default Gateway the same as the LAN IP address of your router (192.168.0.1).

Set Primary DNS the same as the LAN IP address of your router (192.168.0.1). The Secondary DNS is not needed or you may enter a DNS server from your ISP.

Step 5

Click **OK** twice to save your settings.

Technical Specifications

Standards

- IEEE 802.11n
- IEEE 802.11g
- IEEE 802.3
- IEEE 802.3u

Security

- WEP (64/128 bit)
- WPA-PSK/WPA2-PSK
- WPS (PIN/PBC)
- 802.1X

Wireless Signal Rates*

- 54Mbps
- 48Mbps
- 36Mbps
- 24Mbps
- 18Mbps
- 12Mbps
- 11Mbps
- 9Mbps
- 6Mbps
- 5.5Mbps
- 2Mbps

MCS (0-7)

- 130Mbps (270)
- 117Mbps (243)
- 104Mbps (216)
- 78Mbps (162)
- 66Mbps (135)
- 58.5Mbps (121.5)
- 52Mbps (108)
- 39Mbps (81)
- 26Mbps (54)
- 19.5Mbps (40.5)
- 12Mbps (27)
- 6.5Mbps (13.5)

Frequency Range

- 2.4GHz to 2.483GHz

Transmitter Output Power

- 17dBm (+/- 2dB) at 11Mbps, 5.5Mbps, 2Mbps, and 1Mbps at 77°F (25°C)

LEDs

- Power
- Internet
- WLAN
- Ethernet
- WPS

Operating Temperature

- 32°F to 104°F (0°C to 40°C)

Operating Humidity

- 10%-95% non-condensing

Storage Humidity

- 5%-95% non-condensing

Safety & Emissions

- NCC
- CSA International
- FCC Class B
- CE Class B

Dimensions

- Width = 4.76 inches (121mm)
- Height = 1.06 inches (27mm)
- Depth = 3.86 inches (97.92mm)

Warranty

- 1 Year Limited

* Maximum wireless signal rate derived from IEEE Standard 802.11g and 802.11n specifications. Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate. Environmental factors will adversely affect wireless signal range.

Contacting Technical Support

U.S. and Canadian customers can contact D-Link technical support through our web site or by phone.

Before you contact technical support, please have the following ready:

- Model number of the product (e.g. DIR-412)
- Hardware Revision (located on the label on the bottom of the access point (e.g. rev A1))
- Serial Number (s/n number located on the label on the bottom of the router).

You can find software updates and user documentation on the D-Link website as well as frequently asked questions and answers to technical issues.

For customers within the United States:

Phone Support:
(877) 453-5465

Internet Support:
http://support.dlink.com

For customers within Canada:

Phone Support:
(800) 361-5265

Internet Support:
http://support.dlink.ca

Warranty

Subject to the terms and conditions set forth herein, D-Link Systems, Inc. ("D-Link") provides this Limited Warranty:

- Only to the person or entity that originally purchased the product from D-Link or its authorized reseller or distributor, and
- Only for products purchased and delivered within the fifty states of the United States, the District of Columbia, U.S. Possessions or Protectorates, U.S. Military Installations, or addresses with an APO or FPO.

Limited Warranty:

D-Link warrants that the hardware portion of the D-Link product described below ("Hardware") will be free from material defects in workmanship and materials under normal use from the date of original retail purchase of the product, for the period set forth below ("Warranty Period"), except as otherwise stated herein.

- Hardware: One (1) year

The customer's sole and exclusive remedy and the entire liability of D-Link and its suppliers under this Limited Warranty will be, at D-Link's option, to repair or replace the defective Hardware during the Warranty Period at no charge to the original owner or to refund the actual purchase price paid. Any repair or replacement will be rendered by D-Link at an Authorized D-Link Service Office. The replacement hardware need not be new or have an identical make, model or part. D-Link may, at its option, replace the defective Hardware or any part thereof with any reconditioned product that D-Link reasonably determines is substantially equivalent (or superior) in all material respects to the defective Hardware. Repaired or replacement hardware will be warranted for the remainder of the original Warranty Period or ninety (90) days, whichever is longer, and is subject to the same limitations and exclusions. If a material defect is incapable of correction, or if D-Link determines that it is not practical to repair or replace the defective Hardware, the actual price paid by the original purchaser for the defective Hardware will be refunded by D-Link upon return to D-Link of the defective Hardware. All Hardware or part thereof that is replaced by D-Link, or for which the purchase price is refunded, shall become the property of D-Link upon replacement or refund.

Limited Software Warranty:

D-Link warrants that the software portion of the product ("Software") will substantially conform to D-Link's then current functional specifications for the Software, as set forth in the applicable documentation, from the date of original retail purchase of the Software for a period of ninety (90) days ("Software Warranty Period"), provided that the Software is properly installed on approved hardware and operated as contemplated in its documentation. D-Link further warrants that, during the Software Warranty Period, the magnetic media on which D-Link delivers the Software will be free of physical defects. The customer's sole and exclusive remedy and the entire liability of D-Link and its suppliers under this Limited Warranty will be, at D-Link's option, to replace the non-conforming Software (or defective media) with software that substantially conforms to D-Link's functional specifications for the Software or to refund the portion of the actual purchase price paid that is attributable to the Software. Except as otherwise agreed by DLink in writing, the replacement Software is provided only to the original licensee, and is subject to the terms and conditions of the license granted by D-Link for the Software. Replacement Software will be warranted for the remainder of the original Warranty Period and is subject to the same limitations and exclusions. If a material non-conformance is incapable of correction, or if D-Link determines in its sole discretion that it is not practical to replace the non-conforming Software, the price paid by the original licensee for the non-conforming Software will be refunded by D-Link; provided that the non-conforming Software (and all copies thereof) is first returned to D-Link. The license granted respecting any Software for which a refund is given automatically terminates.

Non-Applicability of Warranty:

The Limited Warranty provided hereunder for Hardware and Software portions of D-Link's products will not be applied to and does not cover any refurbished product and any product purchased through the inventory clearance or liquidation sale or other sales in which D-Link, the sellers, or the liquidators expressly disclaim their warranty obligation pertaining to the product and in that case, the product is being sold "As-Is" without any warranty whatsoever including, without limitation, the Limited Warranty as described herein, notwithstanding anything stated herein to the contrary.

Submitting A Claim:

The customer shall return the product to the original purchase point based on its return policy. In case the return policy period has expired and the product is within warranty, the customer shall submit a claim to D-Link as outlined below:

- Customers need to provide their receipt (proof of purchase) even if the product is registered. Without a receipt, no warranty service will be done. The registration is not considered a proof of purchase.

- The customer must submit with the product as part of the claim a written description of the Hardware defect or Software nonconformance in sufficient detail to allow D-Link to confirm the same, along with proof of purchase of the product (such as a copy of the dated purchase invoice for the product) if the product is not registered.

- The customer must obtain a Case ID Number from D-Link Technical Support at 1-800-361-5265, who will attempt to assist the customer in resolving any suspected defects with the product. If the product is considered defective, the customer must obtain a Return Material Authorization ("RMA") number by completing the RMA form and entering the assigned Case ID Number at https://rma.dlink.ca/.

- After an RMA number is issued, the defective product must be packaged securely in the original or other suitable shipping package to ensure that it will not be damaged in transit, and the RMA number must be prominently marked on the outside of the package. Do not include any manuals or accessories in the shipping package. D-Link will only replace the defective portion of the product and will not ship back any accessories.

- The customer is responsible for all in-bound shipping charges to D-Link. No Cash on Delivery ("COD") is allowed. Products sent COD will be rejected by D-Link. Products shall be fully insured by the customer and shipped to D-Link Networks, Inc., 2525 Meadowvale Boulevard Mississauga, Ontario, L5N 5S2 Canada. D-Link will not be held responsible for any packages that are lost in transit to D-Link. The repaired or replaced packages will be shipped to the customer via Purolator Canada or any common carrier selected by D-Link. Return shipping charges shall be prepaid by D-Link if you use an address in Canada, otherwise we will ship the product to you freight collect. Expedited shipping is available upon request and provided shipping charges are prepaid by the customer. D-Link may reject or return any product that is not packaged and shipped in strict compliance with the foregoing requirements, or for which an RMA number is not visible from the outside of the package. The product owner agrees to pay D-Link's reasonable handling and return shipping charges for any product that is not packaged and shipped in accordance with the foregoing requirements, or that is determined by D-Link not to be defective or non-conforming.

- RMA phone number: 1-800-361-5265 Hours of Operation: Monday-Friday, 9:00AM – 9:00PM EST

What Is Not Covered:

The Limited Warranty provided herein by D-Link does not cover:
Products that, in D-Link's judgment, have been subjected to abuse, accident, alteration, modification, tampering, negligence, misuse, faulty installation, lack of reasonable care, repair or service in any way that is not contemplated in the documentation for the product, or if the model or serial number has been altered, tampered with, defaced or removed; Initial installation, installation and removal of the product for repair, and shipping costs; Operational adjustments covered in the operating manual for the product, and normal maintenance; Damage that occurs in shipment, due to act of God, failures due to power surge, and cosmetic damage; Any hardware, software, firmware or other products or services provided by anyone other than D-Link; and Products that have been purchased from inventory clearance or liquidation sales or other sales in which D-Link, the sellers, or the liquidators expressly disclaim their warranty obligation pertaining to the product.

While necessary maintenance or repairs on your Product can be performed by any company, we recommend that you use only an Authorized D-Link Service Office. Improper or incorrectly performed maintenance or repair voids this Limited Warranty.

Disclaimer of Other Warranties:

EXCEPT FOR THE LIMITED WARRANTY SPECIFIED HEREIN, THE PRODUCT IS PROVIDED "AS-IS" WITHOUT ANY WARRANTY OF ANY KIND WHATSOEVER INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT.

IF ANY IMPLIED WARRANTY CANNOT BE DISCLAIMED IN ANY TERRITORY WHERE A PRODUCT IS SOLD, THE DURATION OF SUCH IMPLIED WARRANTY SHALL BE LIMITED TO THE DURATION OF THE APPLICABLE WARRANTY PERIOD SET FORTH ABOVE. EXCEPT AS EXPRESSLY COVERED UNDER THE LIMITED WARRANTY PROVIDED HEREIN, THE ENTIRE RISK AS TO THE QUALITY, SELECTION AND PERFORMANCE OF THE PRODUCT IS WITH THE PURCHASER OF THE PRODUCT.

Limitation of Liability:

TO THE MAXIMUM EXTENT PERMITTED BY LAW, D-LINK IS NOT LIABLE UNDER ANY CONTRACT, NEGLIGENCE, STRICT LIABILITY OR OTHER LEGAL OR EQUITABLE THEORY FOR ANY LOSS OF USE OF THE PRODUCT, INCONVENIENCE OR DAMAGES OF ANY CHARACTER, WHETHER DIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL (INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF GOODWILL, LOSS OF REVENUE OR PROFIT, WORK STOPPAGE, COMPUTER FAILURE OR MALFUNCTION, FAILURE OF OTHER EQUIPMENT OR COMPUTER PROGRAMS TO WHICH D-LINK'S PRODUCT IS CONNECTED WITH, LOSS OF INFORMATION OR DATA CONTAINED IN, STORED ON, OR INTEGRATED WITH ANY PRODUCT RETURNED TO D-LINK FOR WARRANTY SERVICE) RESULTING FROM THE USE OF THE PRODUCT, RELATING TO WARRANTY SERVICE, OR ARISING OUT OF ANY BREACH OF THIS LIMITED WARRANTY, EVEN IF D-LINK HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THE SOLE REMEDY FOR A BREACH OF THE FOREGOING LIMITED WARRANTY IS REPAIR, REPLACEMENT OR REFUND OF THE DEFECTIVE OR NONCONFORMING PRODUCT. THE MAXIMUM LIABILITY OF D-LINK UNDER THIS WARRANTY IS LIMITED TO THE PURCHASE PRICE OF THE PRODUCT COVERED BY THE WARRANTY. THE FOREGOING EXPRESS WRITTEN WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ANY OTHER WARRANTIES OR REMEDIES, EXPRESS, IMPLIED OR STATUTORY.

Governing Law:

This Limited Warranty shall be governed by the laws of the State of California. Some states do not allow exclusion or limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the foregoing limitations and exclusions may not apply. This Limited Warranty provides specific legal rights and you may also have other rights which vary from state to state.

Trademarks:

D-Link is a registered trademark of D-Link Corporation/D-Link Canada, Inc. Other trademarks or registered trademarks are the property of their respective owners.

Copyright Statement:

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CE Mark Warning:

This is a Class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IEEE 802.11b or 802.11g operation of this product in the U.S.A. is firmware-limited to channels 1 through 11.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The following three 3G card have passed the co-located EMC/RF exposure test with this device and may be used with this device. Other 3G cards may or may not comply with the FCC regulations. Please consult the manufacturer before purchase.

The EUT could be applied with one 3G 1XEV-DO Card and the following three different models could be chosen. Therefore emission tests are added for simultaneous transmission between wireless LAN and 3G 1XEV-DO function. The emission tests have been performed at the poorest channel of both WLAN and 3G 1XEV-DO, and recorded in the report.

Interface	Brand Name	Model Name	FCC ID
3G USB	HUAWEI	E220	QISE220
3G USB	HUAWEI	E169	QISE169
3G USB	HUAWEI	E180	QISE180

Industry Canada Statement

This device complies with RSS-210 of the Industry Canada Rules. Operation is subject to the following two conditions:
1) this device may not cause interference and
2) this device must accept any interference, including interference that may cause undesired operation of the device

This device has been designed to operate with an antenna having a maximum gain of 2dBi.
Antenna having a higher gain is strictly prohibited per regulations of Industry Canada. The required antenna impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the EIRP is not more than required for successful communication.

IMPORTANT NOTE:
IC Radiation Exposure Statement:
This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end user.

For detailed warranty information applicable to products purchased outside the United States, please contact the corresponding local D-Link office.

Registration

Register your product online at support.dlink.ca/register

Product registration is entirely voluntary and failure to complete or return this form will not diminish your warranty rights.

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